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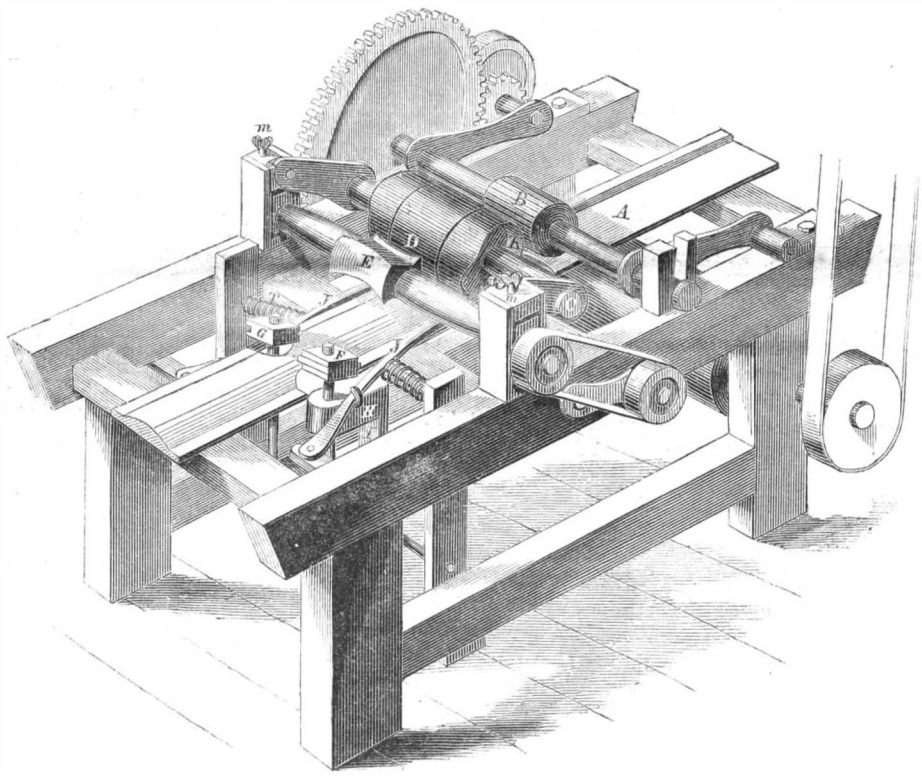
IMPROVED STAVE MACHINE.

We have, in the annexed engraving, the picture of a compact machine, in which the various motions for shaping, jointing, dressing, tonguing and grooving a stave are effected by the most direct and simple contrivances.

The stave is placed upon the bed-plate, A, and carried along by the feed roll, B, over a convex cutter not shown in the engraving; thence forward under the concave cutter, E, and between the two vertical cutters, F and G, one of which forms a groove in one edge of the stave while the other fashions a tongue upon its opposite edge. The vertical cutters, F and G, are carried apart and drawn together to make the stave tapering, by a very simple arrangement. The journal boxes of each are secured to an upright plate, I, which is pivoted at its lower end, and the upper journal box, H, is secured by a hook to the long lever, J, which is pivoted at one end and has the opposite end pressed against the cam, H, which is secured to the shaft of the pressure roller, D; thus the cutters, F and G, are moved apart and drawn together in correspondence with the onward motion which the stave receives from the feed roll, B. Spiral springs, L L, press the journal boxes, K K, together when the turning of the cams permits this approach. The position of the cams upon the shaft is varied for different widths of staves, the cams being held in place by set screws. A complete set of cams is provided to vary the taper of the staves to casks of different sizes. The thickness of the stave is regulated by the position of the upper cutter, E, the journal boxes of which are raised or lowered by means of the screws, *m m*. The feed roller may be pressed down either by weights or springs.

The patentees say that they have a machine in operation and that it works beautifully, producing staves very rapidly and in great perfection. They say also that they find it well adapted to many other purposes, such as making molding, sash and blinds, &c., as it will dress four sides of any stuff at the same operation, and can be arranged to any taper desired. The machine may be made of any strength, and is exceedingly simple and sure in its operation.

The inventor of this machine is James Decker, who has assigned the invention to himself and A. P. McRae. The patent was procured, through the Scientific American Patent Agency, Sept. 27, 1859, and further information in relation to it may be obtained by addressing Decker & McRae, at Reidsville, Ga.



DECKER'S IMPROVED STAVE MACHINE.

THE CARDING MACHINE—A TRULY GREAT INVENTION.

In manufacturing cotton and woolen goods, unless the raw material is properly cleaned and carded, no fine threads can be spun; and, as a consequence, the highest qualities of cloth cannot be produced. Skillful manufacturers who wish to produce superior fabrics are very careful of the carding operations through which the fibrous material is first made to pass. A few years ago, both French and English cloth manufacturers found themselves limited to a quality of goods inferior to those which they desired to make; and they perceived that they could not progress a single step without some new invention to improve the carding machines. Having become deeply impressed with this idea, the cotton manufacturers at Mulhausen (France) took the best steps possible under the circumstances to secure the object desired—they offered a prize of 5,000 francs to the person who would invent a combing machine that would prepare cotton in a superior manner for the spinning operations. A Frenchman named Josue Heilman—a native and rich citizen of Mulhausen—was incited, from a natural mechanical taste, to contend for this prize, not for the small amount of the reward, but from a thirsting desire to make the invention. Being an enthusiast, he actually spent his whole fortune ($100,000) in constructing the machine, for the paltry prize of a few thousand francs that had been offered, and yet he had not fully succeeded. In this stage of his career he went to England, and found some enterprising manufacturers in Manchester, who advanced him money to carry on his experiments, but after several years' struggling to accomplish his object—working and planning day and night, on his machine, assisted by his son—he failed. There was always some defect in the operations which prevented the desired results being secured. Heilman was almost ready to give up the struggle in despair, and he left England and went back to his native place, a poor and almost heart-broken man, having reduced himself and family to poverty in pursuit of an invention which still eluded all his efforts. The idea of inventing such a machine, however, had taken complete possession of his mind, and one evening, while pondering over the subject at his fireside, he observed one of his daughters combing her long hair and drawing it out between her fingers at full length. At once the brilliant idea was suggested that he might invent a perfect combing machine to imitate the same motions. Incited by this beautiful thought, he renewed his efforts with great vigor, and, after several years' labor, he completed his invention, and it was again brought before the Manchester manufacturers, who quickly appreciated its merits. Six cotton companies united together and purchased the right to use it for $150,000; and an equal number of woolen manufacturers paid a like amount to him for wool; while a single manufacturer paid $100,000 for its use to comb flax for making lace thread. This machine combs a lock of cotton through from end to end; it places the fibers parallel with one another; it separates the long ones from the short, and unites them both in separate slivers. It has effected a most wonderful improvement in preparing cotton and wool for spinning fine yarns; and the English manufacturers have secured very great advantages from it.

We regret to state that poor Heilman did not live long to enjoy the wealth which at last flowed in so suddenly upon him. Scarcely had his labors on the combing machine been completed when he died, and his son, who had shared all his privations, soon followed him to the grave. Like a warrior and patriot who had died on the battle-field, with the voice of victory sounding on the gale, so departed Josue Heilman from the "battle of life." It frequently happens thus with inventors and other benefactors of mankind. Upon inquiry, we have not been able to ascertain whether any of these combing machines have yet been introduced into this country. Our manufacturers should devote more attention to the preparation of their cotton, so as to advance in the spinning of fine yarns, because coarse goods are more affected by changes in the price of the raw material than the finer fabrics.

KANSAS, THE LAND FOR MACHINE FARMING.—A correspondent, writing to us on business matters (from Lancaster, Kansas), thus closes his letter:—"I wish to say a word about the country I am in. It lies 10 miles due west of Atchison. We are just commencing to build and open farms. I think it is the most beautiful land and the best adapted for machinery-farming of any that I have ever seen. I often look over these vast, rich, undulating prairies and think of the *steam plow*; there is no rock, root or ravine to be found for miles, or in a thousand acres. Timber is rather scarce; it is only found along the creeks in sufficient quantity for fire-wood. There is at present a heavy emigration to Pike's Peak gold regions, and all the travel from Leavenworth and Atchison passes through this point. Some days more than a hundred persons pass through. It is no humbug now, as every express brings from $10,000 to $20,000 worth of gold, and I have conversed with several that have made handsomely. Atchison is the nearest starting point from the Missouri river, as the road from Leavenworth passes within five miles of Atchison, which is distant from the former 30 miles. There is also a railroad completed to the latter from St. Joseph."

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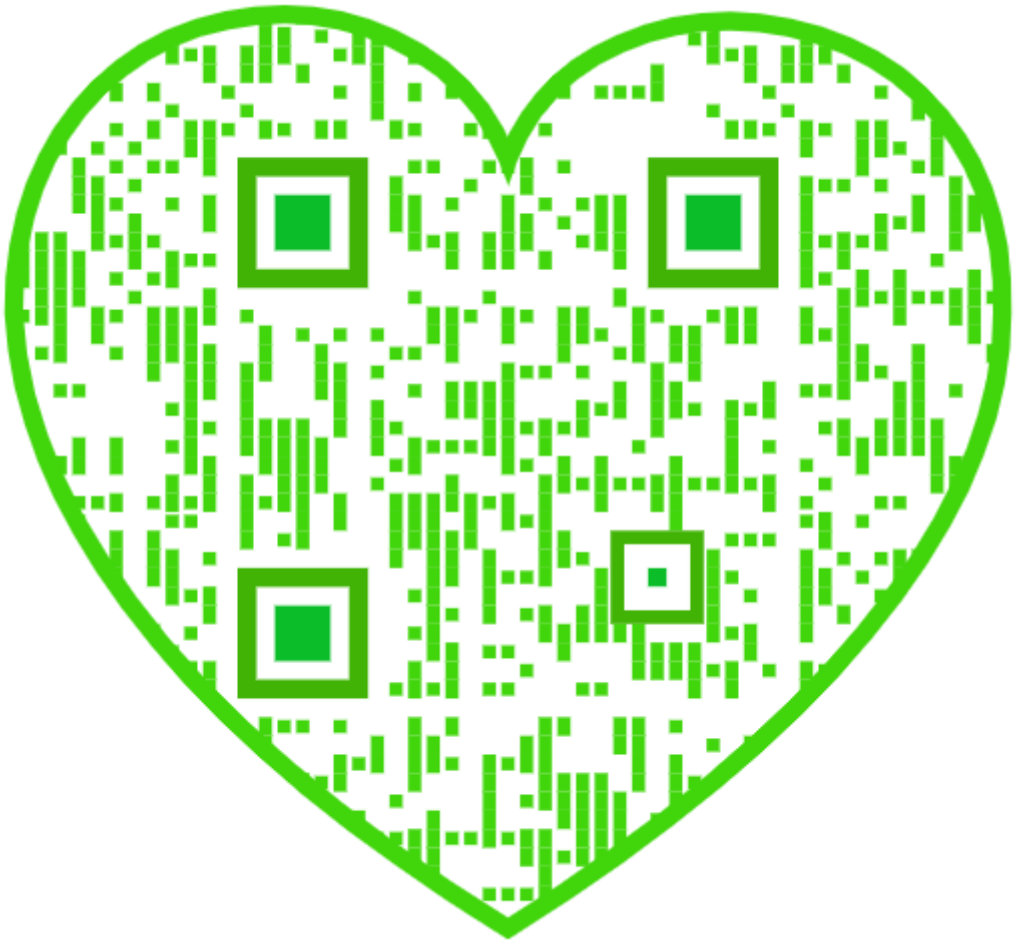

JOURNAL OF PATENT LAW.

EFFECT OF USING A PATENTED ARTICLE UPON A FOREIGN VESSEL IN AN AMERICAN PORT, WHEN SAID ARTICLE, THOUGH PATENTED IN THIS COUNTRY, IS IN COMMON USE IN A FOREIGN ONE.

As the world advances and the relations of men become more intimate, the questions which arise upon the conflict of individual rights are constantly becoming more intricate and refined. The case of Brown *vs.* Duchesne, recently decided by the United States Supreme Court, illustrates this truth. It involved not only the mutual rights and obligations which exist between the United States government and its citizens, but also the reciprocal duties which exist by treaties, or comity, between one government and another.

The above action was brought by the plaintiff, charging the defendant with unlawfully *using* his invention, which related to the "gaffs" of sailing vessels, and which was secured to him by a patent issued by the United States government. The defendant, it appeared, was a subject of France, the master of a French vessel built in France, and owned and manned by French subjects. The improvement in question was in common use in France, and was placed upon the defendant's vessel at the time it was built in France. The vessel, at the time of the alleged infringement, was upon a lawful voyage under the flag of France, from the Island of Minquelon, a dependency of France, and thence back. It was claimed by the plaintiff that, while in the port of Boston, being within the jurisdiction of the United States government, the defendant was prohibited from using such improvement by reason of the plaintiff's patent, and was liable to him for using it as an infringement of his patent. The case was first tried at the Massachusetts circuit, where the court gave judgment for the defendant. It was then carried by writ-of-error to the United States Supreme Court, where, after argument, the above judgment was affirmed. The following is a portion of the opinion of the court:—

Taney, C. J.—"The general words used in the clause of the patent laws granting the exclusive right to the patentees to use the improvement taken by themselves, and literally construed, without regard to the object in view, would seem to sanction the claim of the plaintiff. But this mode of expounding a statute has never been adopted by any enlightened tribunal, because it is evident that, in many cases, it would defeat the object which the Legislature intended to accomplish. And it is well settled that, in interpreting a statute, the court will not look merely to a particular clause in which general words may be used, but will take in connection with it the whole statute (or statutes on the same subject) and the objects and policy of the law, as indicated by its various provisions, and give to it such a construction as will carry into execution the will of the Legislature, as thus ascertained, according to its true intent and meaning. Neither will the court, in expounding a statute, give to it a construction which would in any degree disarm the government of a power which has been confided to it to be used for the general good, or which would enable individuals to embarrass it in the discharge of the high duties it owes to the community, unless plain and express words indicated that such was the intention of the Legislature.

"The patent laws are authorized by that article in the Constitution which provides that Congress shall have power to promote the progress of science and useful arts by securing for limited times, to authors and inventors, the exclusive right to their respective writings and discoveries. The power thus granted is domestic in its character, and necessarily confined within the limits of the United States. It confers no power upon Congress to regulate commerce, or the vehicles of commerce, which belong to a foreign nation, and occasionally visit our ports in their commercial pursuits. That power and the treaty-making power of the general government are separate and distinct powers from the one of which we are now speaking, and are granted by separate and different clauses, and are in no degree connected with it. And when Congress are legislating to protect authors and inventors, their attention is necessarily attracted to the authority under which they are acting, and it aught not lightly to be presumed that they intended to go beyond it, and exercise another and distinct power, conferred on them for a different purpose. Nor is there anything in the patent laws that should lead to a different conclusion. They are all manifestly intended to carry into execution this particular power. They secure to the inventor a just remuneration from those who derive a profit or advantage within the United States from his genius and mental labors. The right of property which a patentee has in his invention, and his right to its exclusive use, is derived altogether from these statutory provisions; and this court has always held that an inventor has no right of property in his invention, upon which he can maintain a suit, unless he obtains a patent for it, according to the acts of Congress; and that his rights are to be regulated and measured by these laws, and cannot go beyond them. But these acts of Congress do not, and were not intended to operated beyond the limits of the United States, and as the patentee's right of property and exclusive use is derived from them, they cannot extend beyond the limits to which the law itself is confined. And the use of it outside of the jurisdiction of the United States is not an infringement of his rights, and he has no claim to any compensation for the profit or advantage the party may derive from it.

"The court is of opinion that cases of this kind were not in the contemplation of Congress in enacting the patent laws, and cannot, upon any sound construction, be regarded as embraced in them. For such a construction would be inconsistent with the principles that lie at the foundation of these laws; and instead of conferring legal rights on the inventor, and in order to do equal justice between him and those who profit by his invention, they would confer a power to exact damages where no real damage had been sustained, and would moreover seriously embarrass the commerce of the country with foreign nations. We think these laws ought to be constructed in the spirit in which they were made—that is, as founded in justice—and should not be strained by technical constructions to reach cases which Congress evidently could not have contemplated, without departing from the principle upon which they were legislating, and going far beyond the object they intended to accomplish. The construction claim by the plaintiff would confer on patentees not only rights of property, but also political power, and enable them to embarrass the treaty-making power in its negotiations with foreign nations, and also to interfere with the legislation of Congress when exercising its constitutional power to regulate commerce. And if a treaty should be negotiated with a foreign nation, by which the vessels of each party were to be freely admitted into the ports of the other upon equal terms with its own, upon the payment of the ordinary port charges, and the foreign government faithfully carried it into execution, yet the government of the United States would find itself unable to fulfill its obligations if the foreign ship had about her, in her construction or equipment, anything for which a patent had been granted. And after paying the port and other charges to which she was subject by the treaty, the master would be met with a further demand, the amount of which would not be regulated by law, but would depend upon the will of a private individual. And it will be remembered that the demand, if well founded in the patent laws, could not be controlled or put aside by the treaty. For, by the laws of the United States, the rights of a party under a patent are his private property; and by the Constitution of the United States, private property cannot be taken for public use without just compensation. And in the case I have stated, the government would be unable to carry into effect its treaty stipulations without the consent of the patentee, unless it resorted to its right of eminent domain, and went through the tedious and expensive process of condemning so much of the right of property of the patentee as related to foreign vessels, and paying him such a compensation therefore as should be awarded to him by the proper tribunal. The same difficulty would exist in executing a law of Congress in relation to foreign ships and vessels trading to this country. And it is impossible that Congress, in passing these laws, could have intended to confer on the patentee a right of private property which would in effect enable him to exercise political power, and which the government would be obliged to regain by purchase, or by the power of its eminent domain, before it could fully and freely exercise the great power of regulating commerce, in which the whole nation has an interest. The patent laws were passed to accomplish a different purpose, and with an eye to a different object; and the right to interfere in foreign intercourse, or with foreign ships visiting our ports, was evidently not in the mind of the Legislature nor intended to be granted to the patentee."

LITERARY AND SCIENTIFIC NOTICES.

THE MANUFACTURE OF COAL OILS.

The second edition of this useful work has just been published by D. Appleton & Co., of this city. This affords evidence of its usefulness and the general interest manifested in the subject. We are not surprised at this result, because its author—Professor Thomas Antisell, who occupies the important position of Chief-examiner in the Chemical Department of the Patent Office—has had the best of opportunities to become acquainted with all that has been patented and published in relation to the manufacture of oil from coal and other mineral hydrocarbons.

A brief history of coal oil is given; and the discovery is dated as far back as 1739. It was first obtained by Dr. Clayton, of England, but only as a product of the destructive distillation of coal. The credit of the invention of manufacturing oil from coal, as an art, by distilling the mineral at a low red heat, is awarded to James Young (now of Glasgow), and only dates back to 1850—ten years ago. His patent is held to be good and his invention exceedingly valuable. The first person who attempted the manufacture of coal oil on our continent was Dr. Gesner, of Brooklyn; the substance from which he obtained it was the bituminous shales of New Brunswick.

The qualities of American cannel coals for producing oils are quoted from a paper by Professor B. Silliman, Jr., and are as follows:—Breckinridge cannel coal, 62.89 volatile matter in each hundred-weight; New Brunswick (Albert coal), 61.74; Chippenville, Pa., 49.80; Kanawha, Va., 41.85. The Torbane Hill cannel coal of Scotland is the richest in oil in the world; it contains 71.9 per cent of volatile matter. The American cannel coals yield from 40 to 105 gallons of crude oil per tun.

Several methods of purifying the oil are described, being a very valuable portion of the work. The merits of different kinds of retorts are discussed, and as the whole economy of this oil manufacture is dependent upon the distillation process, this feature invites particular attention. We know that there is a great difference of opinion among chemists and others regarding the merits of the stationary close, the close revolver, and the open retort. The revolving retorts of J. E. Holmes, of Newark, Ohio, are held by several persons to be the most economical of all; while others think more highly of the open or *meerschaum* retorts of Luther Attwood. These latter were used at the Kerosene-works on Newton Creek, near Brooklyn—the largest coal oil establishment on this continent; but they have not been in operation for several months. We do not know the reason; we only know the fact. These works are capable of turning out 30,000 gallons per month, and that they should be stopped is deeply to be regretted.

The manufacture of coal oils will become a permanent business. This illuminating agent gives the most brilliant light of any fluid known to us, and our mines have inexhaustible material for manufacturing it. We also understand that its use is still rapidly extending. In a great many cases, impure qualities, having a very offensive odor, are still manufactured and sold. Several improvements have yet to be made in the purifying of these oils and in the lamps for burning them. Professor Antisell tells us that coal oils are employed in northern Germany for street lamps; they must be prepared in a superior manner to that which is used with us, or they could not be employed for such a purpose. We understand that their coal oil undergoes more distillation and purification than ours, which accounts for its purity and absence of offensive odor—qualities which it is stated to possess.

AMERICAN ENGINEERING.

This most important and useful work on American machinery is a credit to its author, G. Weissenborn, C.E., of No. 131 Fulton-street, this city; he has already issued 22 numbers, each containing two large sheets of good *working* drawings and some accompanying letter-press. The latest numbers illustrate peculiar mechanism of an interesting nature to every engineer. There are four variable steam cut-offs, namely, Corliss & Nightingale's; N. T. Green's, made at Providence, R. I.; Boyden's, at Newark, N. J.; and Charles Reynolds, manufactured by Mr. Burden, Brooklyn. In Vol. II. of "Engineering Precedents," *patent cut-offs* are slightingly alluded to by the author of that work—Chief-engineer Isherwood; but no fact, we believe, is better established in the operations of steam machinery than that a great

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saving of fuel is effected by the use of a variable cut-off, when the work to be done is variable. No engineer can be *posted up* in his profession unless he is acquainted with the recent improvements in cut-offs, as illustrated in this work, and as they have appeared in our own columns. Our mechanics have devoted more attention to such devices for regulating the power of engines than those of any other country; this, we believe, has been called forth by the peculiarity of American operations. We remember when it was scarcely possible to find an American steam engine that would operate so as to give uniformity of motion to machinery in a factory. Their governor's were so sluggish that, when a few machines in a factory or mill were thrown off, the engine drove the others with such fury that something was sure to break down. These defects are now almost unknown; our present steam engines—thanks to patent cut-offs and sensitive governors—operate like clockwork, and cut off the steam to do the work required—no more and no less—at every stroke. These are great improvements, truly.

In another department our machinists have made most astonishing advances during the past 20 years: namely, the manufacture of tools. We had previously attained undoubted superiority in the manufacture of tools for working wood, but not those for working in iron. We remember when it was scarcely possible to find a good American lathe, planer or gear-cutter; our best tools had to be imported from England. But all this has changed. American iron tools, as now manufactured, are of a very superior character. Some of the English tools are a little better than ours and some of ours are better than theirs, so that we stand about equal; but as our inventors are never to be beaten in anything, and as our country is more extensive than England, and our wants more numerous, we shall soon shoot further ahead. As the accurate, superior and rapid construction of machinery is dependent upon good tools, we have hailed with the utmost gratification our progress in tool-making; it is a sure sign of excellence and advancement in the arts. Several tools, as manufactured by Sellers, of Philadelphia (a distinguished maker), are illustrated by full working drawings in the work of Mr. Weissenborn.

MACAULAY'S COMPANIONS IN THE TOMB.

Baron Macaulay (says the London *Post*) now lies close at the foot of Westmacott's statue of Addison, whom he once so happily described as the unsullied statesman, the accomplished scholar, the master of pure English eloquence, the consummate painter of life and manners, and "the great satirist who alone knew how to use ridicule without abusing it; who, without inflicting a wound effected a great social reform; and who reconciled wit and virtue, after a long and disastrous separation, during which wit had been led astray by profligacy, and virtue by fanaticism." The remains of Addison, however, are at some distance from the spot on which the monument stands—they are in the chapel of Henry VII.; and it was not until three generations had laughed and wept over his pages that any tablet was raised to his memory in the Abbey. Macaulay said of the statue which now keeps watch over the newly-closed grave:—

"It represents Addison as we can conceive him, clad in his dressing-gown, and freed from his wig, stepping from the parlor at Chelsea into his trim little garden, with the account of the 'Everlasting Club,' or the 'Loves of Hilpa and Shalum,' just finished for the next day's *Spectator*, in his hand."

Thickly strewn near the grave of Macaulay, are the relics of men whose names are still held in reverence, and whose works adorn the literature of our country. As a poet, not less than a brilliant essayist, Macaulay has earned a place among the great men of the past and present; and in death the author of the "Lays of Ancient Rome" and the ballad on the "Spanish Armada" will face Thomas Campbell, who won a poet's fame by the "Pleasures of Hope." A few feet from the grave of the enobled poet of the nineteenth century stands the fine old piece of gothic sculpture which marks the resting place of Chaucer—the father of English poetry.

Just opposite to the tomb of Chaucer, "the day starre" of English poetry, is the monument of "Fairie Spenser," the sunrise of our poetry, who died, as Ben Jonson tells, "for lack of bread; refusing the twenty pieces sent him by my Lord of Essex, as he was sorry he had no time to spend them. Fairly obliterated by the hand of Time, the tomb of Spenser bears the inscription, "Here lies the body of Edmund Spenser, the prince of poets in his time, whose divine spirit needs no other witness than the works he left behind him." Beaumont, the dramatist, sleeps here too, but no memorial or inscription marks his resting-place; it is, however, immediately behind Chaucer's tomb. A marble much defaced, erected by the Countess of Dorset, bears in very illegible characters an inscription written by Ben Jonson for the tomb of Drayton. Still nearer Macaulay's grave there is a small pavement stone with the inscription, "O rare Ben Jonson!" which Aubrey tells us was done at the charge of Jack Young, who walking there when the grave was covering, gave the fellow eighteen pence to cut it. At a recent relaying of the pavement of the Abbey the original stone was removed and destroyed. A few feet distant is the monument of Cowley, raised by George, Duke of Buckingham. A monument raised by Sheffield, Duke of Buckingham, marks the grave of Dryden—"Glorious John"—who was followed to his resting-place by mourners in twenty mourning coaches, each drawn by six horses, and at whose requiem an ode of Horace was sung, with an accompaniment of trumpets and hautboys.

The only titled poet that sleeps in this part of the Abbey, is the Earl of Roscommon, the famous master-of the-horse to the Duchess of York at the Restoration. Another companion of Macaulay is Nicholas Rowe. There are also Matthew Prior and John Gay and he whose tomb bore the inscription (in imitation of that of Jonson) "O rare Sir William Davenant!" and Samuel Johnson, David Garrick, and Richard Brinsley Sheridan, and Camden, the father of English history; May, the historian of the Long Parliament; Gifford, the editor of the "Tory Quarterly Review;" Dr. Parr, and numerous others. At the opposite or north end of the transept, there towers above other memorable graves the stately monument of Chatham, of whom Macaulay wrote, and the words are now not less applicable to himself:—"Among the eminent men whose bones lie near him, scarcely one has left a more stainless, and none a more splendid name."

ANCIENT RUINS IN THE UNITED STATES.

A new stimulus is likely to be given to American archæology by a discovery recently made some 90 miles north-east of Fort Stanton, a long account of which has just appeared in the Fort Smith (Arkansas) *Times*:—

The plain upon which lie the massive relics of gorgious temples and magnificent halls, slopes gradually eastward towards the river Pecos, and is very fertile, crossed by a gurgling stream of the purest water, that not only sustains a rich vegetation, but perhaps furnished with this necessary element the thousands who once inhabited this present wilderness. The city was probably built by a warlike race, as it is quadrangular, and arranged with skill to afford the highest protection against an exterior foe, many of the buildings on the outer line being pierced with loop-holes, as though calculated for the use of weapons.

Several of the buildings are of vast size, and built of massive blocks of dark granite rock, which could only have been wrought to their present condition by a vast amount of labor. There are the ruins of two noble edifices, each presenting a front of 300 feet, made of ponderous blocks of stone; and dilapidated walls are even now 35 feet high. There are no partitions in the apex of the middle (supposed) temple, so that the room must have been vast; and there are also carvings in bas-relief and fresco work. Appearances justify the conclusion that these silent ruins could once boast of halls as gorgeously decorated by the the artists', hand as those of Thebes and Palmyra.

The buildings all have loop-holes on each side, much resembling those found in the old feudal castles of Europe designed for the use of archers. The blocks of which these edifices are composed are cemented together by a species of mortar of a bituminous character, which has such tenacity, that vast masses of wall have fallen down without the blocks being detached by the shock. We hope ere long to be favored with full and descriptive particulars, as it is probable that visits and examinations will be made among such interesting relics of the unknown past, by some of the United States officers attached to the nearest fort.

GRIST MILLS AND MILLING.

MESSRS. EDITORS:—I propose to give the readers of the SCIENTIFIC AMERICAN some practical information about milling, as I have been a working millwright for seventeen years, and have put up mills with stones varying from six down to three feet in diameter. These extremes in the sizes of stones in different mills led me to observe their relative merits during a long series of operations; and I can give a very experienced opinion of their qualities, regarding the best size of stones and the speed at which they ought to be run to do the most and best work with the least waste of power. I have attended a steam mill during the past six years; having charge of the milling and doing the mill-work. In it there are five pairs of stones—four for wheat and one for corn. The "run" for grinding corn have a speed of 120 revolutions per minute; they grind 800 lbs. per hour. The ground corn meal is carried up, by elevators, to a sieve 5 feet long and 2 feet wide, driven by a crank, with a 2-inch pitch, and it has a speed of 136 revolutions of the crank shaft. There is a small fan which blows off the light bran; the coarser meal is carried back to the eye of the stone with a small tin spout. We use No. 16 brass wire cloth in the sieve, which does very well, if attention is paid to keep it clean. The speed given to the four "run" of wheat stones is 100 revolutions per minute. We never use a hammer-pick in dressing these stones, as the French burr is liable to wear into holes. We use a plain chisel pick, one inch in breadth, which makes better work than when it is made broader. One "run" of stones grind 560 lbs. of wheat per hour, with a loss of only 4 lbs. in 280. I have given the quantities in pounds because this is the most correct method, as it is difficult to find two men who can measure alike by the bushel. These millstones are each 4 feet 8 inches in diameter. W. M.

Baltimore, Md., April 28, 1860.

EXPLOSIONS IN COAL MINES.

MESSRS. EDITORS:—In a late number of the SCIENTIFIC AMERICAN, you noticed the explosion of "fire-damp" in a coal mine, near Scranton, as corroborating your previous statement of the great exposure of life by the present poor mode of ventilation in mines. The accident referred to was not caused by insufficient ventilation; those mines, like many others in that section, are ventilated by an air passage excavated with and separated from the main tunnel by battened boards; the inner end of this passage opens into the main one, and near its mouth is a chamber containing a large fire which assists the draft and would especially consume all combustible gases. The wire rope holding the platform (on which was a loaded car hoisted almost up to the mouth of the shaft) broke and uncoupled from the drum; the platform and car of course were precipitated and carried with them parts of the structure, smashing in the side of the air passage. Impure air and gases then rushed into the tunnel and were carried, by the downward current, through the shaft into the coal chambers; an explosion was the result, wounding several, and one (it is feared) fatally. It is very unusual for an explosive gas to collect in mines ventilated in the above manner. S.

[Our correspondent states that the explosion "was not caused by insufficient ventilation," and yet it is substantially admitted that it *was*, only that if the ventilating arrangement had not met with an accident, the probability is that the explosion would not have occurred. We are well acquainted with the mode of ventilation described; it is the most simple and common, but it is a very imperfect system, as we shall clearly show. A coal mine cannot be properly ventilated unless a current of fresh air is made to flow continually through all the passages and rooms; now, as the draft through a mine, where a fire is used in the up-take shaft, depends entirely upon the size and intensity of the fire, which is seldom uniform, the ventilation can neither be uniform nor certain. For some mines this system of ventilation is sufficient, while for others, it is not.—EDS.

THE DANGER OF TATOOING.—The *Journal de Rouen* states that the medical statistics having shown that several cases of loss of limb, and even death, had occurred from the practice of tatooing so common among seamen, the maritime authorities in France have recommended the discontinuance of the practice.

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COMBINED HARROW AND SEED-SOWER.

The machine represented in the annexed engraving has been extensively introduced to practical use, mostly in California, and has received the highest testimonials in regard to its successful operation, and great value to the growers of grain. It is designed to save not only the whole of the labor of sowing, but a portion also of that of harrowing, the same team doing both harrowing and sowing that is ordinarily required for harrowing alone, while the operator rides at his ease instead of trudging through the plowed ground in the hard labor of holding the harrow.

In this machine the motion of the revolving harrow is in the direction opposite to that of the wheels, as will be seen by examining the connections. The harrow is made in two parts, D and D, each of which consists of a cast iron cylinder with the wrought iron, steel-pointed teeth firmly screwed into its circumference. Upon the outer end of each cylinder is an iron collar or wheel furnished with steel pins which mesh into holes in the rim of the driving wheels, by which means the rotary motion is communicated to the harrow. The cylinders are drawn along by means of the bars which connect their ends with the axle-trees, these bars being pivoted to the axle-tree so that the harrow may rise over any obstruction which it may encounter, and also be raised or lowered to adjust its hight to any depth to which it may be desired to pulverize the ground. For the purpose of this adjustment the metallic plates, E E, which suspend the harrow from the triangular frame, are pierced with a series of holes, through either of which may be passed the pin which secures the plate to the frame.

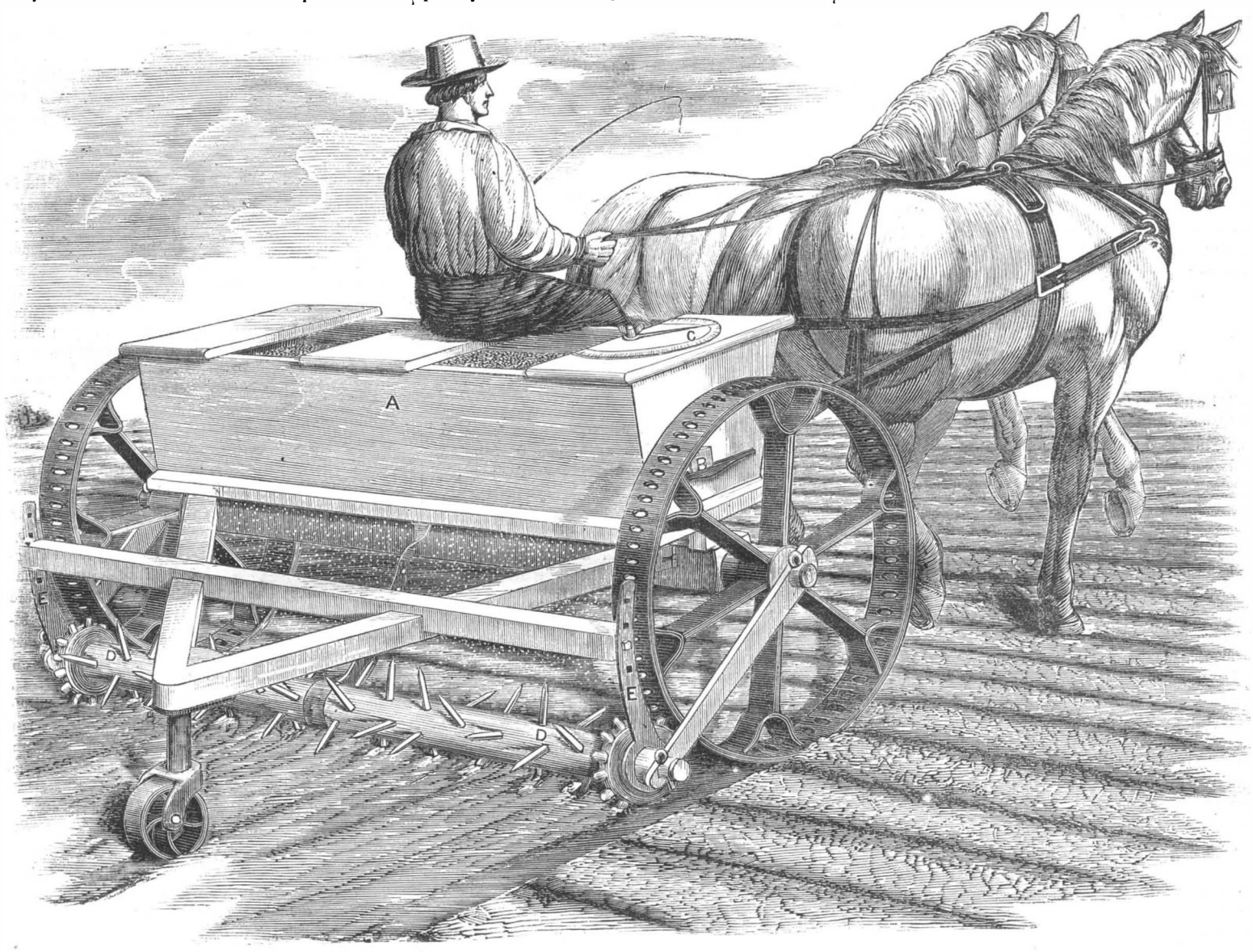
The seed is placed in the box, A, and is scattered out as the machines moves along through a series of holes through the bottom of the box, extending its whole length. The flow of the seed may be regulated by varying the size of these holes; for which purpose a long plate, pierced with an equal number of holes, is fitted snugly below the bottom of the box, and is so connected with the index, C, that, by turning this index the plate is made to slide so that its holes will correspond in whole or in part, or none at all, with the holes in the bottom of the box, thus varying the size of the openings, or closing them altogether at the will of the operator. The seed is shaken through these openings by a toothed rod which is caused to vibrate by means of cams upon the inner sides of the wheels, which come in contact with the projecting ends of the rods and force them inward; the rod being made in two pieces and each piece pressed outward by a spring.

The advantages claimed for this machine are, first: The perfect harrowing of the land, the clods not being gathered in heaps as by the ordinary harrow, but torn, tossed and beaten by the teeth until they are perfectly fine, and the ground is left in good tilth. Second, The seed is uniformly distributed, and the quantity to the acre may be accurately adjusted at will, when the same quantity will be sown upon each acre. Third, The grain being immediately covered after being sown, none of it is eaten by the birds—a very important consideration in many parts of the country. It is claimed that this machine will sow from from eight to ten acres per day, harrowing in the grain perfectly.

This sower and harrower was awarded the highest premium—a gold medal—at the California State Fair, a silver medal at the Fair of the Mechanics' Institute in San Francisco, and the highest premium in cash at the fair at San Jose, Cal., all in 1858.

The patent for this machine was secured, through the Scientific American Patent Agency, March 27, 1860, and further information in relation to it may be obtained by addressing the inventor, Henry Hewitt, agent, or W. A. Sanford, at Potsdam, N. Y., or Hosea Willard, at Vergennes, Vt.

Rights for territory are for sale, with sample machines and patterns for castings. Address as above.



HEWITT'S COMBINED HARROW AND SEED-SOWER.

THE planets Venus, Jupiter and Saturn are all now visible in the evening, near each other, in the western sky. The lowest one is Venus, then Jupiter, and then Saturn.

BODIES FALLING THROUGH THE AIR.

MESSRS. EDITORS:—Would you be so kind as to tell me, through your valuable paper, how many feet or inches a flat plane will fall through the air in the first second, with a surface of 10 feet by 20 feet (making 200 square feet), with a weight of 400 lbs. attached to it; and how much pressure per square foot on its surface, supposing it to fall perpendicular? Could you give me a rule to find how many feet or inches bodies fall per second with given surfaces and weights? If you could give me the desired information, you would much oblige me. J. W.

Boonton, N. J., May 4, 1859.

[A flat plane of 200 square feet area, and with a weight of 400 lbs., equally divided all over its surface, will fall a distance of 24.162 feet in the first second, and its velocity will increase until it reaches 30.227 feet per second. With this velocity it will continue to fall, provided it is kept perfectly horizontal, and the retardation due to the resistance of the air counterbalances the acceleration due to the gravity. The pressure of the air on the underside of the falling plane at a velocity of 30.227 feet per second, is equal to 32 ounces per square foot; making the pressure on the entire surface equal to 400 lbs. It is generally assumed that the resistance is equal to the square of the velocity, which rule corresponds pretty nearly with the results obtained from various experiments; and, by applying this rule, you can find the resistance at the end of the first second. The rule by which the above results are found can only be expressed by mathematical terms.—EDS.

HOOSAC TUNNEL.—The western face of the tunnel is for the present left by the workmen, and a large force is employed on the shaft. Nearly 80 feet of the shaft has been excavated, and the rock continues to be the original mica slate of which the solid mountain is composed. The shaft, 7 by 14 feet, is to be sunk 290 feet in order to reach the line of the tunnel. The distance reached at the eastern face is over 1,600 feet horizontally, and we have been shown a specimen of the rock thrown out by a blast this week. It is soft mica slate, with slight veins of quartz.—*Adams Transcrspt.*

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EDITORIAL CORRESPONDENCE.

TANNING—IRON-SMELTING—SAWMILLS—GLASS-MAKING.

CONSTANTIA, N. Y., May 1, 1860.

The country along the northern shore of Oneida lake is somewhat changed for the better within a score of years, but not as much as it ought to be. One cause of this, we believe, is the bad roads. Were the people in this district to unite heartily and construct a good macadamized road from end to end of this lake—and they have plenty of excellent materials for this purpose—their lands would soon rise in value. Strangers judge favorably or unfavorably of the capacity of a country and the thrift of its people, by the condition of its roads. In saving time and promoting commerce, good common roads are as essential to farmers as railroads are to merchants.

There are extensive tanneries in this section: one at Vienna Corners, another at Cleveland—the old "Eagle" of William Foster, Esq.—and that of the Messrs. Robertson, at Constantia. Excellent leather is made in all of them, but we only had time to visit the latter. At present, the prices of hides are so high, in comparison with those of leather, that a number of tanners have wisely reduced operations. Hemlock bark is the tanning agent that is used here; there are still considerable quantities of it in this vicinity, but within our remembrance, its price has risen from $1.25 to $3 per cord. Messrs. Robertson's tannery is quite extensive—hides to the value of $100,000, original cost, being on hand undergoing the various processes. There is a good water power and wheel at this tannery, but a powerful steam engine is also employed. The furnaces of the boilers are arranged to burn the spent wet bark which is conveyed and fed to them in such a manner as to have its moisture expelled in a great degree before it is ignited. At one period the spent tan bark in tanneries was a nuisance; no use was made of it; now it is a common agent for raising steam and generating power. The hides, after being steeped, softened, sweated, unhaired, and prepared for the tanning operations, are first treated with weak liquors (*handlers*), in which they undergo considerable handling at the beginning of the process, and very little during the succeeding stages. It takes about six months time from the commencement until a hide of good sole leather is tanned. These tedious processes, we believe, will yet be greatly shortened, and with advantage to all tanners. The hemlock bark, after being grated pretty fine, is placed in large square tanks or *leeches*, twelve of which are used in this factory, and these are heated by steam to about 160° Fah., to obtain the tanning liquor. Several liquors are taken from the bark in order to extract all the astringent substance. The only ingredient in hemlock bark capable of forming leather, by combining with the gelatine of the hides, is tannic acid. A small quantity of gallic acid is also extracted, but it exerts no tanning influence whatever. The first liquors in which the hides are handled are comparatively weak, and are made up partly of spent, and partly of new ooze, pumped from the leeches. They contain considerable gallic acid, but it has been held that an excess of such acid was required to *plump* the hides and permit the tanning to reach the interior. This may be so, but we have a different opinion. We believe that spent liquors should all be run off, and never used over again. The reason we advance for this is, that when there is an excess of gallic acid in any liquor, it converts the tannic acid into gallic, and thus a great quantity of the tanning principle is destroyed, thereby entailing loss of material and requiring longer time and more bark to tan the hides. Weak and fresh liquors should be used at first; the liquors should be gradually raised in the usual manner to the end of the process, and more handling than usual should be employed. Such a system, we believe, would greatly shorten the process; all chemists are agreed as to the convertibility of tannin into gallic acid by long exposure, and its utter destruction, thereby, as a tanning substance. Some of the best sole leather we ever examined is made at this factory, and it has a high character in the "Swamp," at New York.

In this place there was, formerly, an iron-smelting furnace. The ore employed was the brown hematite of Oneida county—the fuel, wood and charcoal. The ore contained about 66 per cent of metal, to which about 11 per cent of limestone was added as a flux. The pig iron produced was of excellent quality, but the hearth of Vulcan is now cold, and his bellows have ceased to blow. The site here selected was once favorable, when hard wood was almost valueless, but since it has become dear, the expense of importing the ore from a distance of about 40 miles will not pay.

A great quantity of pine and hemlock lumber is still manufactured here from the native forests. There are a few turbine wheels running, but the great majority are overshots. At Judson's mill, on Constantia creek, a set of gang saws are in operation; the water power is excellent and capable of driving a great amount of machinery. Gang saws make very superior boards; all the other mills employ single long saws; no circular saws were seen.

A short distance from the lake, and extending along its whole length, there is a ridge of beautiful cream-colored sand, which was accidentally discovered, several years ago, to be excellent for making window glass. Three large glass factories have been erected—two at Cleveland, and the third three miles further west. The two former we have visited and witnessed the almost nude "salamander" operatives blowing glass cylinders for our windows, through their long iron trumpets. We learned a peculiar fact in relation to glass-smelting being so dependent on clay for success. The large pots or crucibles in which the crude glass materials are melted in the furnace are principally composed of German fire-clay. It seems that most of that which was imported last year was of an inferior quality; hence many of these pots have broken in the furnace, thus entailing a great loss of materials and, in some cases, occasionally stopping entire factories during the winter. As a consequence there is much less glass on hand, at present, in New York. The substances used in glass-making are sand, some lime and carbonate of soda; the sand is perfectly infusible without the admixture of the alkaline substances. At the factory of Landgraff & Sons, at Cleveland, there had been no suspension of operations; none of their smelting pots had failed in the furnace, because the senior proprietor is an old and very skillful German glass-maker, well acquainted with mixing the crucible clay. The glass made in this section is of good quality. It is first blown into cylinders; these are then split through the middle, by drawing a red-hot rod along the side of each, when cold; after this they are introduced into a highly-heated oven and placed on a revolving iron bed, when they open like leaves and are flattened like sheets of paper, by the attendant operative. The operations of glass-blowing involve great manual dexterity and powers of endurance. The operatives make high wages, and they deserve them; those who blow the largest sheets are paid in proportion. The prices of glass, as quoted in our city papers, are always accompanied with "discount, 50 per cent." The customs prevailing in regard to the selling of it differ from those of other manufactured articles, in this respect.

AMERICAN NAVAL ARCHITECTURE.

THE STEAMER "MAIZE."

The *Maize* is one of a number of medium-sized steam vessels now being built in this country for a company of Spanish gentlemen in Havana, Cuba. Her hull was built by Messrs. C. H. & Wm. M. Cramp; her machinery by the well-known manufacturers, Messrs. Reaney, Neafie & Co., of Philadelphia, Pa. We herewith subjoin particulars relative to her construction:—Length from fore-part of stem to after-part of stem post, above the spar deck, 184 feet 6 inches; breadth of beam (molded) at midship section above the main wales, 30 feet 4 inches; depth of hold, 12 feet; draft of water at load-line, 9 feet 6 inches. Her frame is of white oak, cedar, and locust, and securely square fastened with tree-nails, spikes, bolts, &c., and diagonally strapped with iron inside ceiling, the knees forming straps. The floors are molded 13 inches, sided, 8 inches, and finished with angle iron. Frames are 28 inches apart at centers.

This steamer is fitted with one vertical crosshead condensing engine; number of cylinders, 2; diameters of same, 40 inches; length of stroke of piston, 36 inches; diameter of propeller, 9 feet 4 inches; material of same, brass; number of blades, 4; width of same, 5 feet, and they have a pitch of 18 inches. She has two flue and return tubular boilers, located in hold; has no water bottom; does not use blowers to furnaces; has one smoke-pipe, two bilge pumps, one fire pump, two bilge injections, and bottom valves or cocks to all openings in her bottom.

The maximum pressure of steam is 20 pounds, with variable cut-off. Revolutions at above pressure, 34, and draft of water of 9 feet 6 inches. Ample protection has been made with iron, felt, and other materials against communication of fire from boilers. Her bunkers are of wood; she has three watertight athwartship bulkheads and three anchors.

The cabins are nicely furnished, and afford good accommodations for passengers. Her intended route is on the line of the San Pelaya Company, of Cuba.

The tunnage of this steamer is 600 tuns.

THE STEAMER "PHILADELPHIA."

The *Philadelphia* was built by Reaney, Neafie & Co., of Philadelphia, and placed on the route of her intended service (Washington to Aquia Creek) at the commencement of this year. As she has at all times more than exceeded the anticipations of her builders, we annex the particulars of her hull and machinery:—Length on deck, from fore-part of stem to after-part of stern post, above the spar deck, 215 feet; breadth of beam (molded) at midship section, above the main wales, 29 feet 6 inches; depth of hold, 9 feet; draft of water at load line, 5 feet 6 inches; diameter of water-wheels, 29 feet: material of same, cast iron. Her frame is of wrought iron plates, ½ to ⅝ of an inch in thickness, and securely fastened with rivets at proper distances. The floor timbers at throats are molded, 4½ inches; sided ⅞ of an inch, and are shaped \. The distance of frames apart at centers is 16 inches. Has 4 long keelsons, 20 inches deep by 12 inches.

This steamer is fitted with one vertical beam condensing engine; diameter of cylinder, 44 inches; stroke of piston, 11 feet. She has one return tubular boiler, located in hold; does not use blowers, and has no water bottom; one smoke-pipe; one independent steam, fire and bilge pump; one bilge injection, and bottom valves or cocks to all openings in her bottom. Ample protection with sheet iron and felt has been made against fire communicating from the boiler to the surrounding woodwork.

Her saloon cabin is finely fitted-up, and affords pleasant accomodations to passengers; she has a promenade deck, and is supplied with water-wheel guards, fore and aft. She is owned by the Seaboard and Roanoke Railroad Company.

The tunnage of this steamer is 550 tuns.

CURIOUS PRODUCTION OF INTENSE HEAT.—Much amusement has on many occasions been produced among the juveniles, by handing them each a small fragment of amorphous antimony, with a request to hold it very firmly between the thumb and finger of the left hand, and then rub it very hard with the edge of a file—such as is found on nail-scissors will do; it then instantly evolves so much heat as almost to burn the skin; the sharp but harmless pain causes much fun to the lookers-on, by the violent motion to get rid of it. Amorphous antimony was discovered by Mr. Gore, of Birmingham, England, and the following is his method of making it:—Take two parts of hydro-chloric acid, and after adding as much oxyd of antimony as it will dissolve, add one more part of acid. Then pass a current of electricity from a galvanic battery through the solution by means of an anode of antimony and a cathode of copper in the form of a thin sheet; continue the action for two or three days, until the antimony is deposited sufficiently thick on the copper; then remove it from the copper by bending the sheet under water, and it will fall off in flakes. Dry it carefully, and preserve it in cotton wool for future experiment.—*Septimus Piesse.*

LINSEED OIL STATISTICS.—The *Commercial Bulletin*, of Boston (which is, by-the-way, an excellent journal), raves like a town-crier in regard to the statistics which we gave on page 201, respecting the quantity of linseed oil imported. Our information was drawn from a source which might be considered reliable, viz: the *American Almanac* for 1860, published in Boston. Our object in writing upon the subject was to stir up our own manufacturers to more interest in the matter; and if, in calling attention to the subject for this purpose, we relied too much upon published statistics, it certainly is not a very grave matter, or one that need to disturb our co-temporary's equanimity.

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THE HEXAGONAL CELL OF THE HONEY-BEE.

BY W. J. WEEKS.

It has always been a subject of wonder, amounting even to a subtle mystery, how the bee could construct its congeries of waxen cells of such exact uniformity of size and shape, and combining with the least expenditure of room and material, the greatest capacity and the utmost strength. So difficult of solution has the problem seemed, and so unsatisfactory have the theories respecting it appeared, that some *savans* long since began to regard this geometrical feat of the bee as referable only to the divine presence and emanation. It is curious to remark the expressions of various writers in allusion to it, and selections from a few of them will be here presented as introductory to the forthcoming solution.

Dr. Evans has writen the following elegant lines:—

"On books deep poring, ye pale sons of toil,
Who waste in studious trance the midnight oil,
Say can you emulate with all your rules,
Drawn or from Grecian or from Gothic schools,
This artless frame? Instinct her simple guide,
A heaven taught insect baffles all your pride.
Not all your marshal'd orbs, that ride so high,
Proclaim more loud a present Deity,
Than the nice symmetry of these small cells,
Whereon each angle genuine science dwells."

Dr. Bevan says:—"A honey-comb is allowed to be one of the most striking achievements of insect industry and an admirable specimen of insect architecture. It has attracted the admiration of the contemplative philosopher in all ages, and awakened speculation not only in the naturalist, but also in the mathematician, so regular, so perfect is the structure of the cells, that it satisfies every condition of a refined problem in geometry. Still a review of their proceedings will lead to the conclusion (as Huber has observed) that the geometrical relations which apparently embellish the productions of bees are rather the result of their mode of proceeding, than the principle by which their labor is guided. We must, therefore, conclude that the bees, although they act geometrically, understand neither the rules nor the principle of the arts which they practice so skillfully, and that the geometry is not in the bee, but in the great Geometrician who made the bee, and made all things in number, weight and measure. The hexagonal form of the cells in a honey-comb has been regarded, and is indeed now generally acknowledged by philosphers, to be the result of the mechanical laws which influence the pressure of cylinders composed of soft materials. The nests of solitary bees and the *royal* cells in a bee-hive are uniformly circular; and the cells in the pith of wood, which are hexagonal in the central parts, are circular towards the circumference, where there is diminished pressure; hence it is inferred that the hexagonal form is produced by the general reaction of the solid parts on each other."

In the work on entomology of Kirby and Spence, the following remarks occur:—"The most profound philosopher, equally with the most incurious of mortals, is struck with astonishment on inspecting the interior of a *bee-hive*. He beholds a city in miniature. He sees this city divided into regular streets composed of houses constructed on the most exact geometrical principles and the most symetrical plan, some serving for store-houses for food, others for the habitations of the citizens, and a few much more extensive than the rest, destined for the palaces of the sovereign. He perceives that the substance of which the whole city is built is one which man with all his skill is unable to fabricate; and the edifices in which it is employed are such as the most expert artist would find himself incompetent to erect. And the whole is the work of a society of insects! Nor have its mysteries yet been fathomed. Philosophers have in all ages devoted their lives to the subject, from ancient Aristomachus of Soli, in Cilicia (who, we are told by Pliny, for fifty-eight years attended solely to bees), and Philiscus the Thracian (who spent his whole time in forests, investigating their manners), to Swammerdam, Reaumur, Hunter and Huber, of modern times. Still the construction of the comb of a bee-hive is a miracle which overwhelms our faculties."

Other writers, even to the latest, might be quoted without affording any more light in explanation of the mystery, yet the solution is so little abstruse as to be the occasion of much wonder that it should have remained so long undiscovered by the astute philosophers, mathematicians, and naturalists who have, for centuries, successively given it their attention.

[To be continued.]

DEFECTS OF CALF-SKIN LEATHER.

The article which we published on page 67 of the present volume of the SCIENTIFIC AMERICAN, on "dry rot" in calf-skin leather, has attracted considerable attention from all those interested in the leather business. The defect in calf-skin leather which we mentioned is admitted, but there is a difference of opinion as to its cause. One of our correspondents stated (on page 137) that he believed it was effected by the use of resin oil in dressing; while another considered it was owing to a want of moisture and air. A correspondent of the Boston *True Flag* (who states that he is an old currier) quotes our article, and gives it as his opinion that the cause of this leather rot is *potash*. We quote what he says on this head:—

"Now, then, I will tell you the *cause* of this 'rot,' leaving the SCIENTIFIC AMERICAN to furnish the *remedy*. In the first place, French skins are not, comparatively speaking, used in this country. They have been superseded by imitation. The great beauty or peculiarity of a French skin is its glove-like softness. About sixteen years ago, it was discovered that the oil in which deerskins are tanned—called 'sod oil,' and containing large quantities of potash—would, when mixed with tallow, produce the softness so much desired. The same effect may be produced by a mixture of potash, neatsfoot oil and tallow. Potash is not used in dressing cow-hides or kip-skips. Hence they are not subject to this rapid deterioration. When I was a boy a pair of boots would last me a year. Now from three to four pairs are necessary. Cause, *potash*. I am an old currier, and know the truth of the above statement."

The "old currier" no doubt knows what is used in dressing leather, but why does he make such a *dead-set* against a little potash mixed with neatsfoot oil, by attributing to it the whole blame of the leather rot, when he asserts that the deerskins of the Indians are treated with oil containing potash, and it is well known that these skins are not affected with dry rot? Here is an apparent contradiction to his conclusions. We, however, believe that potash is decidedly objectionable to use for dressing leather, because it forms a soap when mixed with neatsfoot oil and grease. Potash, like every other alkali, acts chemically upon leather and such like animal substances, and tends to disorganize them. If potash is the cause of dry rot in calf-skin leather, the remedy is easily furnished—*don't use it*. The correspondent of the *True Flag* is not exactly correct, however, regarding the use of French calf-skins in our country. We annually import foreign leather to the value of about $3,000,000 (not including gloves), and about $88,000 of boots and shoes.

A correspondent engaged in the manufacture of leather, writing to us from St. Louis, Mo., gives it as his opinion that the defects of calf-skin leather "are due to the excessive use of muriate of ammonia (sal-ammoniac) in the *bate*." This chemical substance when in excess will act injuriously upon the skins, because the alkali predominates in it. This remedy for this, he states, is better management of the skins in the *bate*. No more sal-ammoniac should be employed than will just suffice to neutralize the lime.

MAGNITUDE OF SOUTHERN RAILROADS.

In speaking of the southern railroads and of the prosperity of the southern States, the *United States Economist* says:—If their roads are few and ill-conducted, there is either a lack of capital or of commerce, or of both, or there is an unwholesome adherence to old ideas; if, on the contrary, their roads are numerous and well managed, the inference is clearly legitimate that a large amount of commerce is pressing for accommodation, and that it is under the control of a competent and intelligent people. Measured by this standard, the South has something of which to be proud. We have compiled the following statistics, showing the extent and the value of railroad property in the several southern States. The figures date up to the close of 1859, and show the length of road constructed or in the course of construction, the length in actual operation, and the cost of the roads, including building and equipment:—

States.	Length.	In operation.	Cost.
Virginia	2,058.5	1,525.7	$43,069,360
North Carolina	1,020.0	770.2	13,998,495
South Carolina	1,136.0	807.3	19,083,343
Georgia	1,617.2	1,241.0	25,687,220
Florida	730.5	289.8	6,368,699
Alabama	1,822.4	798.6	20,975,639
Mississippi	445.1	365.4	9,024,444
Louisiana	1,160.0	419.0	16,073,270
Texas	2,637.0	284.6	7,578,943
Arkansas	701.3	38.5	1,130,110
Missouri	1,337.3	723.2	31,771,116
Tennessee	1,434.4	1,062.3	27,348,141
Kentucky	698.4	468.5	18,852,062
	16,828.1	8,794.1	$235,960,842

POLYTECHNIC ASSOCIATION OF THE AMERICAN INSTITUTE.

[Reported expressly for the Scientific American.]

On Thursday evening, the 26th ult., the usual weekly meeting of the Polytechnic Association was held at its room in the Cooper Institute, this city; Mr. Bruce in the chair.

MISCELLANEOUS BUSINESS.

Device for Teaching Children.—Mr. B. Brown, of Huntington, L. I., exhibited an apparatus under the name of the "Primary Instructor," designed for teaching young children to read, spell, cipher, &c. It consists of of a frame abont five feet square, with wires stretching across it, some horizontal, and some vertical. Upon these wires are strung cubical blocks, sliding and revolving independently of each other. At the left side of the frame are four vertical wires, each containing 40 blocks, on three sides of which are pictures of familiar objects, 240 in all. At the right of the object blocks are 10 vertical wires each carrying 40 blocks, in all 400. On each of these last are words, in all 1,200, being the names of objects, and appropriate adjectives and verbs. By this arrangement it will be seen that a picture of an object and its name in a considerable variety of simple sentences may be presented to the child. A small part only of the whole process is here described, but yet sufficient to convey an idea of its construction and use.

Mr. Godwin was well pleased with the apparatu, and thought that it should be recommended by a vote of the club.

Mr. Garvey—The apparatus is to be commended for its ingenuity, but is too complicated for practical use. The common numerical frame, with a few real objects, and a blackboard would be better. The theory is correct but is carried too far.

Mr. Seely had little faith in short cuts to knowledge, and even in such plausible schemes as phonography. The way we were taught to read, the loving mother or the school-mistress pointing out the letters with a penknife was perhaps the best. The letter A may be as interesting an object to a child as an elephant, and the acquaintance with it is more important. Knowledge of strange things is not what children need. The end of education should be to prepare the mind to receive knowledge. The fashion of the present day of cramming all sorts of sciences into a child's little head is altogether wrong.

Castors for Chairs and Sofas.—Mr. Garbanati exhibited (for Dr. Thos. P. Fry) an improved castor. The roller frame is provided with a spring, so that when the chair or sofa is occupied, the spring yields, and the chair rests firmly on its feet instead of on the roller, thus relieving the castor from the weight. The castors cost no more than the common sort, while it is claimed they will operate better and last longer.

The chairman then called up the regular subject —"Iron Buildings."

DISCUSSION.

Mr. Ayres read a paper repeating some of his statements at the preceding meeting, and adding other facts and arguments, in order to present a precise and comprehensive view of the whole subject. The paper gives a history of the use of iron in buildings, claiming for Mr. Bogardus the invention of the first and only successful plan of using cast iron as a substitute for stone and brick. Mr. Bogardus' first iron building was erected in 1848, and was taken down in 1858 on account of the widening of Duane-street.

Mr. Johnson—When was the first fire-proof building erected in this city?

Mr. Ayres—I cannot tell.

A Gentleman—Are there any fire-proof buildings in New York?

Mr. Ayres—Harper's building, perhaps, is nearest being truly fire-proof. The Crystal Palace, although of glass and iron, was easily destroyed, for the reason that the iron was supported by wood, and when the wood was consumed, the iron fell by its weight. The iron in a building should be an independent structure fully capable of sustaining itself and whatever rests upon it. On the question of expansion I may state that Harpers' Building is about 100 feet long and joins at each end with brick buildings. Yet here no effect of expansion has been observed.

Mr. Garbanati—Buildings may be fire-proof, yet their

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contents burn, and it may be that in some cases the fact that the walls stand increases the distinction enabling the contents to burn as in a furnace. Buildings do not take fire, but *that which is in them.*

Mr. Ayres—A fire occurred in an iron building in San Francisco, which was full of combustible materials. The building stood firm although everything in it was fiercely consumed. The firemen tried in vain to pull down the building with ropes, and assisted by horses. But the building was finally removed in the proper way, and with no difficulty, by taking it to pieces as it was put up.

Mr. Whittemore—In Chicago we had a very different experience. In one case in particular, I distinctly recollect that the bolts were sprung by the heat and the whole structure came down in a mass.

Mr. Reid—In the London *Mechanics' Journal*, of 1824, there is a description of an iron lighthouse 16 or 18 feet square, with a column and lantern all of iron. The lighthouse was erected on the wharf at Glasgow.

Mr. Johnson—In 1839 Mr. Fairbairn constructed a corn mill entirely of iron; it was erected in Turkey. The walls were of sheet iron of proper thickness, consolidation and bound together by cast iron columns and girders. It had an arched roof of corrugated sheet iron. In Peru, S. A. a custom-house and warehouse, 2 stories high, 70 feet square, with a balcony, have been erected. They were made and set up in Manchester, England. In 1775 Smeaton first applied cast iron beams in the north of England, and up to 1801 little progress had been made. In that year Philips & See, of Manchester, built a fire-proof mill; Boulton & Watt executed the work. In connection with the ornamentation of iron the name of Quintin Matsys is remembered by all. In Antwerp there are still remaining many evidences of his skill. At the burning of the Crystal Palace, glass, iron, silver, gold and copper wire melted. If the Cooper Building should take fire it would fall. Cast iron becomes weak and brittle before it melts. A stick of wood will retain its form longer in a furnace than a bar of iron of the same bulk.

Mr. Godwin—About 30 years ago, a large quantity of cast iron columns were brought to New York from England. Long before any iron buildings were built here, Mr. Jordan L. Mott advocated the plan of a building wall composed of hollow cubical blocks, tied together by wrought iron rods.

Dr. Young—Buildings should be so constructed that in case of fire, the fire would be confined to one floor or one room. Cast iron contracts on cooling, and if the cooling is too sudden, it cracks. Pattern-makers generally provide for a contraction of $\frac{1}{8}$ inch to the foot in casting.

Mr. Reid—In England, now, they are proposing to erect an extensive fortification entirely of iron.

Mr. Seely—Without impeaching the statement of Mr. Ayres, that he has not observed that expansion is of any practical account in iron buildings, I am yet not content. The fact and the exact amount of expansion by heat are undisputed, it is also understood that the expansion of iron is irresistible. When the fact of expansion is made sensible and familiar to us in so many ways, it seems strange that it has not been observed in Mr. Bogardus' building. Professor Horsford, by means of a plummet suspended in the Bunker Hill monument, has shown that the monument daily sways back and forth by the heat of the sun. Let a careful test be applied to any iron building, and the expansion must be noticed. The brick walls against which Harpers' Building abuts, must move every day; and if one of them be so rigid as to be unyielding, the effect on the other may be of real practical consequence. In many familiar cases the expansion of iron in ordinary changes of temperature is of practical account and provision is made for it, as in tubular bridges, arches and girders for masonry, &c.

Mr. Ayres—I can only repeat that I know of no instance of iron buildings in which expansion is taken into account. We are erecting an iron building 700 feet long, and we do not think it at all necessary to provide for expansion.

Mr. Seely—Mr. Bogardus so puts together a building that it is a unit with no joints to spring apart or close up. The angles are generally right angles, and the directions are straight. He seems by his plans in the beginning to have anticipated and prevented the injury from expansion. But vary the construction a little, and the effect of expansion would be noticeble.

Mr. Garvey—The expanion of wood by hygrometric conditions is a far more serious evil in a building than the expansion of metals by heat. Wood also expands by heat.

Mr. Seely—Wood expands by moisture only across the grain; in that direction it would do little damage in beams. Wood expands less by heat than metal. Wood is also so yielding as to accomodate itself to the expansion with little injury.

Mr. Garvey—The force of wood swelling by moisture is used in quarrying, and I doubt the statement that wood expands less than iron by heat.

Mr. Garbanati—Wood should be protected by paint so that moisture shall not penetrate it.

Mr. Johnson.—Wood is named in treatises on horology as the substance which expands less than any other, and as the best material for a pendulum when the expansion is not compensated by the ordinary means. At my house I have evidence, every day the sun shines, of the fact of expansion of iron. Under the heat the whole tin roofing is set in motion, and cracks and rumbles as if some one was walking on it.

Mr. Howe has seen in watch stores many regulators of wood. The value of wooden pendulums is well understood by clockmakers.

Dr. Van Der Weyde—The old clock of the City Hall had a wooden pendulum. The rods that are operated by the keys of an organ are always wood. Metal would not answer on account of the expansion.

Mr. Johnson—Nature understands wood-making better than we do iron-making. When a cast iron beam is deflected by a weight, the deflection increases by a continuance of the load, and may eventually break under it; or if the load is removed, the beam will not resume its original form.

The subject ordered for the next meeting is "Expansion."

FACTS IN PHOSPHORESCENCE.—At a recent meeting of the Academy of Sciences, Paris, a paper by Dr. Phipson, on some new cases of phosphorescence was read. The author shows that native sulphuret of antimony or stibine glows with a phosphoric light when it is heated in a crucible to a dark-red heat. When copper, silver, or gold are melted before the blowpipe in a piece of charcoal, they also become phosphorescent at this high temperature; copper, in this case, is seen to shine like the glow-worm, with a greenish yellow light; the effect is striking when the phosphorescence is viewed through a piece of blue glass. The mineral lepidolite, which was not known to possess such a property, is, according to our author, very phosphorescent before the blow-pipe, especially when viewed through the blue glass. Dr. Phipson has discovered, also, that sugar of milk or lactine becomes phosphorescent on being broken or ground down in a mortar—a fact not devoid of interest, as it brings sugar of milk still nearer to other sugars, such as cane sugar and mannite, which are also phosphorescent in the same circumstances. Finally, the author describes what he terms the finest case of mechanical phosphorescence he has ever witnessed. It happens when a certain quantity of large dry crystals of nitrate of uranium are shaken up violently in a glass bottle, through which magnificent flashes of light are seen to shoot. M. Phipson has experimented on a great variety of other salts, but none, except proto-chloride of mercury, gave any light that could be compared to that produced by the crystals above named.

NATURAL HISTORY SPECIMENS.—A pamphlet has been issued giving instructions to persons who may be willing to take the trouble to send specimens of natural history, such as minerals, skins of animals, of birds, snakes, &c., to the great national collection of these specimens which is being made by the Smithsonian Institution. It is requested that the most common species of each neighborhood should be forwarded. The pamphlet of instructions will doubtless be sent to any one who may write for it to Professor Joseph Henry, the secretary.

GRAIN CRADLE FINGERS.—An obliging correspondent, writing from South Groton, Mass., says:—"I would state to your correspondent, G. C., of Georgia, that there is a machine used by A. V. Blanchard & Co., of Palmer, Mass., for dressing grain cradle fingers, which I think is not patented."

A COLUMN OF VARIETIES.

A firm in Savannah has just received an order for 200,000 feet of pine lumber, for the Holy Land. Portions of the cargo are destined for Jerusalem and Damascus. A similar venture made last year was successful. As the Savannah *Republican* truly remarks, "there is something novel in the thought that the palaces of the Holy Land are to be rebuilt with materials taken from the forests of Georgia."……A complete canvas of Cincinnati has lately been made, with a view to obtain information in reference to its manufacturing interest. It appears that there are engaged as operatives in manufacturing and mechanical pursuits, 23,161 men, 1,423 girls, and 949 boys. The value of the aggregate annual production is $66,502,440……It is estimated that no less than nine thousand men will leave Iowa, this season, for Pike's Peak……A building, covering 36,000 square feet, has been erected at Toronto, C. W., for the manufacture of railroad rails……There are now over 2,000 miles of railroad in operation in Canada. The Grand Trunk Railway is certainly a gigantic undertaking. The whole extent of this line is about 1,100 miles. To the construction of this great road, Canada has contributed $16,000,000—the balance of the capital has been advanced by shareholders in England, and the line is now in working order, and at a total expense of $60,000,000 ……We see that the upright stem of vessels, which was first introduced in this country, and which—no longer than when the *Niagara* first visited London—was condemned by the English critics, has been adopted not only in the largest English ships, but also in the navy of France……A hunter of pigeons has done a heavy business this Spring by following the pigeons from point to point—gaining his intelligence by telegraph. He commenced operations some weeks ago in Virginia, and has lately been in Michigan, and at nearly every place where he has stopped he has been very successful. A paper published at Grand Rapids, Mich., dated April 3d, states that in four days he shipped from that place 600 dozen—40 barrels,……The London *Journal of Gas-lighting* in speaking of the recent fatal explosions in the mines, and of the unprecedented series of shipwrecks, intimates that the legislation for the purpose of protecting persons from such accidents has defeated its own ends and tended rather to increase the evil……The famous "purple" of the Romans was a deep crimson….The St. Paul (Minn.) *Times* reports that "recently about three dozen fine fat cattle went down on the *Grey Eagle*, for New York, the first which ever went to that great market from this neighborhood. They were raised in various parts of northern Minnesota, and collected by the shipper. He pays $20 per head, through freight."….One-tenth of one per cent of the atmosphere contains oxygen enough for the supply of the whole present population of the world for 10,000 years……There is a very handsome young fellow in the Indiana Lunatic Asylum, whose self-conceit is said to have become morbid, and is actually the cause of his insanity……The clipper ship *Andrew Jackson* has recently made the shortest trip yet from New York to San Francisco—89 days and 7 hours—six hours shorter than the famous trip of the *Flying Cloud*…..The Savannah *News* describes the performance of the caloric yacht *Marie Louise*, at that port, and says she proved "the entire adaptation of the caloric engine to the propulsion of small vessels."……The schooner *Matilda* recently arrived at Honolulu, from Fanning's Island, with 10,000 gallons cocoa-nut oil, which sold at a good profit. It is estimated that 20 or 25 nuts will make a gallon of oil, which is used for making soap, and for the hair. It is thought that a very large quantity will yet be gathered ……J. Mosheimer, of San Francisco, Cal., writes to us that the first silver ore from the Washoe mines was smelted at his laboratory, and that 40 tuns have been smelted, yielding about $3,000 to the tun. It is the general opinion in California that these will prove to be the richest silver mines in the world……Chloroform has been administered to a child, during sleep, a painful surgical operation performed, and the child allowed to continue its sleep, awaking in the morning unconscious of anything unusual having occurred…… The late prize fight would afford the London *Times* a good text for one of its interesting articles on the physical decline of the Americans……Corliss & Nightingale publish the statement that the "James Steam Mills," of Newburyport, Mass., paid them $19,734.32, as the amount saved in fuel, by the use of one of their engines, during five years.

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IMPROVED OSCILLATING ENGINE.

The Pittsburg people seem to be devoting more attention to the oscillating engine than it receives anywhere else. We have already illustrated several improvements in it made there, and we now present two more. These relate to that class of oscillating engines in which the steam is introduced through a side pipe, and they are intended to overcome two difficulties which have been encountered in that class of engines.

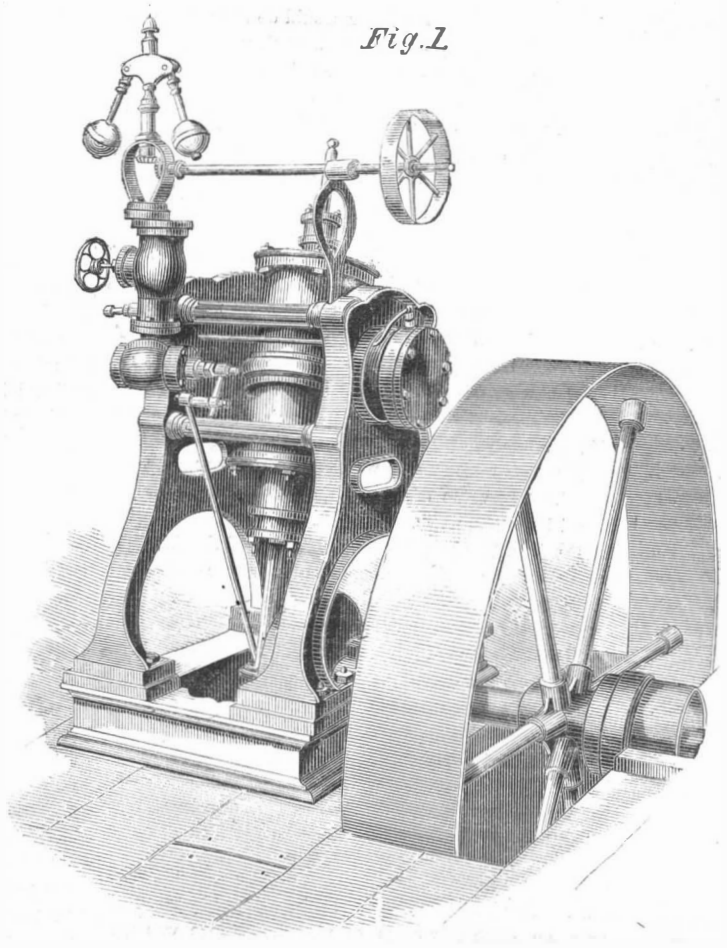
First, The pressure of the steam forcing the face of the pipe away from its contact with the face on the cylinder to which it is fitted varies with the varying pressure of the steam, so that the means resorted to, heretofore, to counteract this pressure exerting a constant force, have either pressed the cylinder against the face of the pipe with unnecessary power or have allowed an escape of the steam. In this contrivance the tendency of the steam to force the cylinder away from the face of the induction pipe is balanced by the pressure of the steam itself upon the opposite side of the cylinder, so that it varies in force exactly in accordance with the pressure which it is designed to counteract. A pipe, *g*, Fig. 5, communicating with the induction pipe, brings the steam into a cylindrical chamber opposite the trunnion, *a*, and behind a piston, F, which is fitted to work in this chamber with suitable packing to prevent the escape of the steam. The piston presses against a steel pin which bears against the end of a similar pin in the end of the trunnion, so that the pressure of the steam acts on the cylinder with but little friction. It will be seen that this arrangement causes the pressure of the steam to vary alike on both sides of the cylinder.

A modification of this arrangement is shown in Figs. 2 and 3. The piston, F, is fitted into a cylindrical opening in the outer side of the induction pipe, and a rod, *l*, connected with it is carried through a stuffing-box in the inner side of the pipe, which rod acts through the levers, *m* and *h*, upon the pin, *r*, pressing it against the pin, *s*, in the end of the trunnion.

The second difficulty sought to be overcome by this invention is the unequal expansion of the side pipe in its different parts, resulting from the steam which comes in from the cylinder being warmer than that which passes out through the eduction ports. To remedy this, two pipes, *t t'*, Fig. 4, are carried from the induction chamber, *g*, to cavities in the inner wall of the eduction chamber, *h*, near the eduction ports, *j* and *j'*, and return pipes, *v v'*, are constructed, by which means a current of hot steam is made to flow through the parts of the side pipe near the eduction ports, and thus keep the face of the pipe at the same temperature in its several parts.

Several large fortunes have been made during the present generation by improvements in the steam engine; two, at least, by modifications in the valves, and as this miracle-working machine is constantly extending its beneficent power, improvements in its details are constantly becoming of more and more value.

Fig. 1



MACKINTOSH'S IMPROVED OSCILLATING ENGINE.

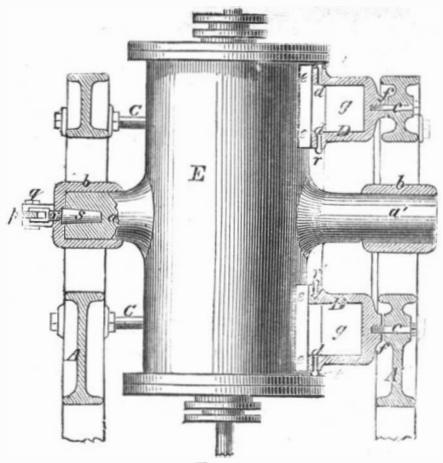


Fig. 2

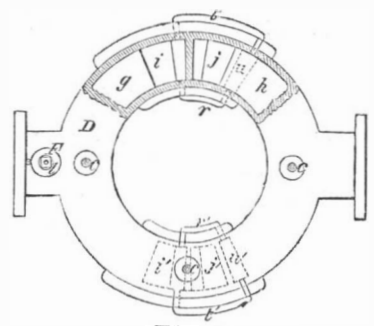


Fig. 4

Fig. 3

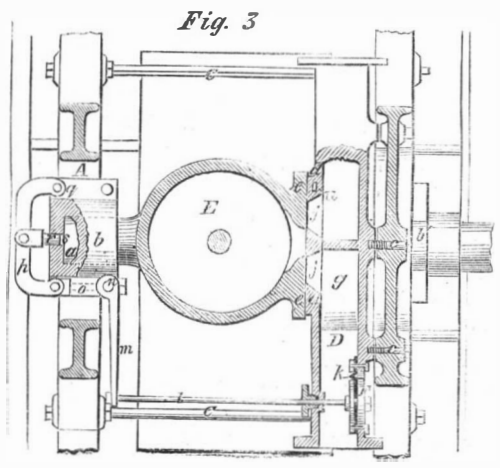
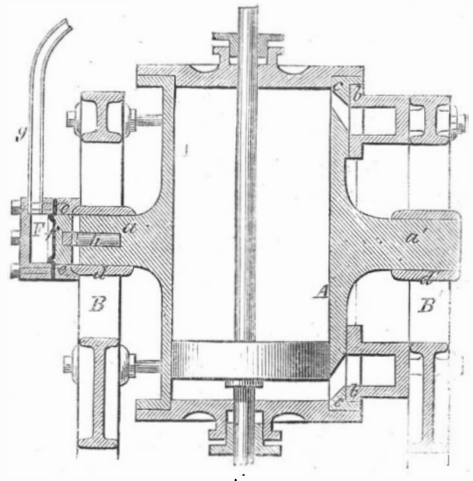


Fig. 5



The inventions above described are secured by two patents, both procured through the Scientific American Patent Agency—one issued to W. S. Mackintosh and James Hemphill, and the other to W. S. Mackintosh alone, both dated Jan. 17, 1860. Further information in relation to the matter may be obtained by addressing Mackintosh, Hemphill & Co., steam engine manufacturers, at Pittsburg, Pa.

THE TYRIAN PURPLE.—It is certainly wonderful that two of the finest colors known—namely, the purple of the ancients and the celebrated Chinese green, or *lokao—i. e.*, the finest color furnished by the animal kingdom, and the finest color furnished by the vegetable kingdom—are produced by the direct ageney of light. At the last meeting of the Academy of Sciences, M. Lacaze-Duthiers read a paper upon the production of the Tyrian purple, and has again called attention to the wonderful part light plays in the formation of this color—a fact that has long been well known. The only thing really novel in this long dissertation is the description by its author of the organs which, in certain marine mollusca, secrete the colorless liquid that finally turns to purple when exposed to the air and to daylight. This organ is nothing more than a small cluster of cells, situated at the surface of the animal's body, and quite distinct from the *corpus bojani*, or kidney of gasteropodous mollusca. The product secreted by this organ in the genera, *purpura* and *murex*, is a colorless, whitish, or slightly yellow liquid, which is extremely photogenic. "The action of light upon this liquid," says our author, "has for effect the development of the three simple colors, yellow, blue, and red; between which are observed, as effects of mixture, green and violet. When the experiment is made in diffused daylight—that is to say, slowly—the order in which the colors appear is observed in a very perfect manner. But whilst the yellow disappears as the action of the light continues, the blue remains constantly in a certain quantity, so that the red is never to be obtained alone, and the purple produced by these natural means is always more or less violet." M. Lacaze-Duthiers, has, moreover, experimented photographically with this Tyrian purple; he has obtained proofs upon silk, batiste, &c., which, although they do not offer the perfections of ordinary photographs, present, nevertheless, in the numerous details, a great strength of tone. In an image thus obtained, we again meet with the colors above named: a greenish yellow corresponds to the white parts, and a more or less dark violet to the dark portions, of ordinary photographic proofs.—*London Photographic News.*

ON the night of the 27th ult., the steamboat *A. T. Lacey* took fire on the Mississippi, at Booth's Point, 125 miles below Cairo, and was completely consumed. A great number of passengers threw themselves overboard and were drowned.

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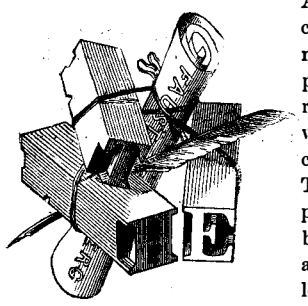
VOL. II., No. 20.....[NEW SERIES.]....*Fifteenth Year.*

NEW YORK, SATURDAY, MAY 12, 1860.

AMERICAN TYPE-SETTING MACHINES.



Art of type-composing consists in setting-up metallic letters in separate pieces, and arranging them into words, sentences, lines, columns and pages. The type thus composed, after having been printed from on a press, are distributed, letter by letter, with all the requisite spaces and punctuation marks, into boxes, ready to be set up again. This was the great discovery of Guttemberg, (1436) whereby he was enabled to use the same type over and over again for different literary productions. The tedious labor of composing and distributing type by hand is well known. Each *pick* of type requires two motions—back and forth—of the hand in setting-up, and yet it is remarkable how much work one expert printer can execute in ten hours. A skillful compositor can set up and distribute eight thousand "ems" in one day, and this averages two and a half picks for each, or about 80,000 movements of the hand and arm.

When it is considered that machinery executes work more rapidly than can be done by hand, the reasonable idea has been entertained that this hand labor might be superseded. Many efforts have been made in this direction, and several type-setting machines have been constructed, both in Europe and America; but with only one exception—to which we shall hereafter refer—all have been unsuccessful, so far as we have knowledge. At the present moment this subject seems to be exciting some attention, both at home and abroad; but as the public and inventors generally do not seem to be aware of what has already been done in this department, we purpose to give them some reliable information.

In recent numbers of the London *Mechanics' Magazine*, the question, "will type-setting machines pay," has been discussed; and Robert Hattersley (a correspondent of that journal) states that he has such a machine in action, and that it operates economically. We learn, that it is as yet, only an experiment, and that it has not been tried sufficiently to prove whether it may not meet the same fate as its European predecessors, one of which was illustrated on page 105, Vol. II, (old series) of the SCIENTIFIC AMERICAN.

We have recently noticed in our Boston cotemporaries, some flattering comments upon a machine for this purpose—the invention of C. W. Felt, of Salem, Mass. This improvement may be a valuable one, but its author does not seem to be fully aware of what others have done in the same field of invention. The inventor states that his machine is operated by keys like a piano, and then says in regard to printing, "The last great step, the introduction of type-setting machinery, has yet to be taken. Much has already been done and the prospect is very fair that it will be accomplished."

We assure our London and Boston cotemporaries that the thing *is* accomplished already, and that type-setting and distributing machines have been in operation in this city for several years. It is now about eight years since we first examined two such machines (invented and patented by William Mitchell), in operation in the printing establishment of Mr. John F. Trow, of this city; and as there were some doubts of their success, then, we have at considerable intervals of time taken the trouble to inspect them personally and watch their operations. These two type-composing instruments have now increased to ten, with six others for distributing the type—all by the same inventor. For plain book-work we have been assured that they effect a saving of about 30 per cent. One of those for composing somewhat resembles a melodeon. The type is placed in rows above small boxes at the ends of keys, with which the compositor "plays up" his copy into metallic composition. Each touch of a key opens a valve, and a type drops down upon a revolving tape, of which there is one for each letter, and the whole of these have their motion so regulated as to deposit the letters in unison with the movement of the keys upon a general traverse tape which carries them to a "composing stick," where they are arranged in proper lines, ready to be lifted by hand and placed on the galley for adjustment. When adjusted, the type is taken off in lines, by a peculiar clasp-composing-rule and properly arranged in columns. These machines are very simple, considering the number of motions executed; but we do not say they are above improvement—we have not yet seen the mechanism that had arrived at such a climax.

The distributing machines are quite neat and small. The type are placed in a long channel and carried forward to a vibrating finger which trips each separately, and makes it drop into a proper groove in a revolving ring below, from which each letter is stript off and conducted into its receiving plate, ready to be fed into the composing machine. Boys attend the distributing machines, and two compositors are at once employed on a setting-up machine. While one is adjusting his composed type, the other is setting-up copy, and thus the productions of two different authors may be going through the same *mill* nearly at the same time. These machines are not an experiment now; they have been tried for years, and are reduced to practical, every-day operations.

The good people of London will soon have an opportunity of witnessing some of these inventions at work in their venerable and vast city, as Mr. Mitchell left New York for Liverpool on the 28th ult., with one composing and one distributing machine, which he intends to introduce into the British metropolis. It is said that London printers are very conservative, but we really hope they will give these machines a candid examination and a fair trial.

IS A PATENT LIABLE TO LEVY AND SALE ON EXECUTION?

This is a question which has been so frequently asked of us recently that we have taken pains to examine it carefully, and now give the result of that examination. We think that no such power exists, either in regard to a patent right or a copyright, which both stand upon the same footing in this respect. It is a little remarkable that no adjudicated case can be found wherein this question has been directly decided; but, after a pretty careful search and inquiry, we have been unable to find any such. But questions have arisen incidentally affecting this subject, and which throw light upon the principle by which it should be controlled.

In the case of Sawin *vs.* Guild (1 Gallison's Reports, 485), a suit for infringement was brought against a sheriff for having sold a patented machine without a license from the patentee. It had been levied upon and sold by him by virtue of an execution against the patentee. The court held that this was no infringement—not because a patent might be levied upon and sold in this manner, but because the sale in this case was merely of the materials of which the machine was composed, and did not include the right to use the machine at all. Surely, if an interest in a patent could even be levied upon and sold, that was the very case in which it might be done.

In the case of Stevens *vs.* Cady (14 Howard, 528), and and again in Stevens *vs.* Gladding *et al* (17 Howard, 448), the question was brought before the Supreme Court of the United States, whether a sale on execution of a copper plate engraved for printing maps, for which a copyright had been obtained, gave to the purchaser the right to print and sell the maps. The court held that it conveyed no such right; that the purchaser of the copper plate possessed no other right to use it than he would have enjoyed if he had prepared and engraved it himself; and that a license from the holder of the copyright was necessary to enable him to print and sell the maps after he had the plate.

In delivering the opinions in these cases, the court expressed the opinion that neither a copyright nor patent right is liable to be levied upon and sold on execution; and, although that point did not rise directly in those cases, so that these opinions may be regarded as *obiter dicta*, still, coming from the source they did, they are certainly entitled to be regarded as possessing great weight.

But, to lay aside authority and refer to principle, how would an attachment or levy be made of this intangible property? Will the sheriff seize upon the patentee himself? The courts have decided that a seizure and sale of the patented machine conveys no right in the patent itself. How, then, can the levy be made?

Again, how will the property be transferred after being thus sold? The only way provided by law for transferring any interest in a patent is by a written instrument, which must, within 90 days after its execution, be recorded in the Patent Office. Is there any other mode of making such transfer? Suppose, after a sale on execution, the purchaser should find on the records of the Office an assignment from the patentee, dated either before or after his purchase, could he set aside such a transfer unless, at least, he could show fraud in the assignee? These difficulties seem to us insuperable; and hence we conclude that there is no power to attach or levy upon the incorporeal right secured by a patent or copyright.

But cannot such property be subjected in any mode to the payment of debts? Certainly it can. The act of Congress sufficiently provides for its being used by executors for that purpose. By the law and the practice in England, it goes to assignees in bankruptcy; and the same rule would be observed here under a bankrupt law passed by Congress. In both countries it could doubtless be subjected to the payment of debts in proper cases, through the instrumentality of a bill in chancery.

The power of the chancellor operates upon the person of the patentee. It can direct him to execute an assignment which may be placed upon the records of the Patent Office, and it can commit him to prison until he complies with the order. The assignment thus recorded would be notice of the transfer to all the world, in the same way as in case of an assignment by an executor or assignee in bankruptcy, and would therefore be in accordance with the provisions of the act of Congress authorizing the assignments of patents.

Whether it is competent for State laws to authorize the transfer of an interest in a patent by levy and sale, has never, as we believe, been settled by judicial decisions. It certainly cannot be done as the laws now stand; some mode of making the levy is evidently necessary for that purpose. Nor do we believe any State law can cause a transfer of such interest in any other way than by an instrument executed by the party himself or some one legally authorized to act for him. A law which should authorize a guardian to make such conveyance for a minor or insane person would doubtless be valid; but we doubt whether a sheriff's deed would be sufficient to convey a title of this kind. Such, at all events, would not be the case without the enactment of provisions different from any which we believe to exist in any State in the Union.

THE ACHIEVEMENTS OF SCIENCE.

Never, in the history of the world, has science been more actively and efficiently engaged in pushing its researches, than now; and mainly because this is an age of peace. Hitherto, war has been the rule—peace the exception. Now, it is the reverse. Time is allowed to men to apply their mental energies to more elevated and useful purposes than slaying one another, pillaging cities, and subverting empires. The steam engine saves labor; the telegraph economizes time; hence less work, greater comfort and more leisure are secured to the busy brain-worker—leisure for devising appliances which shall be the instrumentalities of a higher civilization, at once enobling and happyfying. Horrid wars, in the past, destroyed the populations; gentle peace, in the present, increases them. But to preserve the increasing millions physically, science must be appealed to; morally, religion. Thus it is that, in every year of the world's future history, science will become more perfectly the hand-maid of religion, and they will be co-workers in making this earth an Arcadia more enrapturing than any of which

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philosopher ever dreamt, or poet sang, but which the prophets of Divinity pre-shadowed in the declaration: "The desert shall bud and blossom as the rose." A double verification; for while science will cover the Saharas of the world with waving grass and bending corn, our holy religion will fructify the moral wastes and make of earth a paradise fit for the home of angels.

In proportion as the population of the world increases, the aids of science are becoming more and more indispensable towards making two blades of grass grow where before there grew but one; and the acre of to-morrow must yield the double of to-day's. Hence, a better and a brighter day is dawning for men-of-mind—for those who possess inventive genius and combine with it the industry and the love of its exercise and application. Hard is the heart which does not sorrow over the ill requital of the men of a generation or two agone, whose whole lives were expended in wearing anxiety of mind and wasting toil of body, in poverty, if not even in destitution, in eliminating machineries which were destined to enrich those whom they never knew; in whose veins no kindred blood flowed, while they themselves were to end their labors and their lives in sight of fruitions which the hands of them and theirs were never to gather!

It was a sad record of two weeks ago (SCIENTIFIC AMERICAN, page 276) that, in a single branch of an industrial department, the men who, during the last century, initiated machineries which now fill the mouths of millions of the two greatest nations on earth with bread, died miserably poor; and some of their immediate descendents were only saved from death by want, through public pity! The prospect, however, is cheering, that a better fate and a higher reward await the Kays, and Pauls, and Higbeys, and Hargreaves, and Whitneys, of the present and coming generations, and that they will become the Arkwrights, the Cramptons, and the Peels of our own time, for because of them "Cotton is King!"

Whatever may have been the demands of past ages, inventive genius is the necessity of the present. If the sword has hitherto reigned supreme, science must be its successor. The sword may initiate or construct an empire, but science, in its application to industrial pursuits, in the direction of machineries for manufactories, and implements for farms, must be invoked to sustain it. Nations can live by the sword no longer, for the dominion of barbarism has passed away, and empire must be humanitarian and christian, founded on true knowledge and its wise application.

THE ENGLISH POLICE.

The English papers are never weary of vaunting the wonderful efficiency of their police, and it is almost impossible to converse five minutes with an Englishman in this country without hearing him mention something that would not be "allowed" in England—actually boasting of the shackles on his own harmless actions. Such is the *talk*; but a recent event has given the world a real glimpse into the real truth of the matter. Tickets for the late brutal prize fight were advertised in one of the leading London papers, and openly sold at five places in the city, on the day before the combat; notwithstanding all this publicity, the men met in the very heart of England, within 40 miles of the metropolis, and pounded each other's heads and faces for more than two hours, in the presence of lords, earls, marquises, and a crowd of people of all classes, considerable numbers of whom had their pockets picked, at the time, of their watches and purses.

FOREIGN NEWS AND MARKETS.

The London *Engineer* states that, in Leeds, the machine trade is very active, and there are several orders on hand for flax machinery, chiefly for Belgium and Germany. The manufacture of tools for government orders is very brisk, and at Sheffield there is continued activity in steel manufacture. All the forges are busy, and considerable difficulty is experienced in getting work done punctually, The manufacture of English files for continental orders is brisk: the best qualities being in most demand. Electro-plated goods are in good request; but it is regretted by the English papers that the orders from America have been very limited this Spring for all kinds of Sheffield wares. A machine for rolling the tires of iron railway wheels, without a weld, has been put in operation, and is working satisfactorily. A large number of orders for such tires have been received. Some steel tires are also being rolled in the same manner.

The Great Northern Railway, in England, has hitherto held the "A No. 1" position for the speed of its trains; but recently the Scottish trains have rather surpassed them. This has led the company to decide upon introducing a larger and more powerful class of engines, and 12 of these have been designed by Mr. Sturrock, the locomotive engineer of the road. They are to be furnished with 7-feet driving wheels and 17-inch cylinders. The tenders will also be larger to carry more fuel, and thus save stoppages; otherwise there is to be no especial novelty about them, but their average speed will be about 50 miles per hour.

In Manchester, there is an association for suppressing the practice of falsely labelling or marking goods for sale; and the most respectable mercantile firms in all the English manufacturing towns have joined it. The practice of selling goods marked for a certain length, while they are short of this length, has become so common that most persons were so used to it as to hold it no fraud at all; but a bill is about to be introduced into Parliament to meet such cases.

In Great Britain, there are now 32,500,000 cotton spindles in operation in the factories, and these have been increasing at the rate of 45,000 per week, or 2,300,000 per annum. In Russia, there are only 70 cotton mills, comprising 100,000 spindles, in operation.

In France, there are 2,624 locomotives employed on all the railroads, of which 2,521 were made in that empire. When railroads were first introduced upon the continent of Europe, the locomotives were obtained from England; but Italy, France, Austria, Germany and Russia are now independent of England for their engines —they construct their own. On the German railroads, there are 2,850 engines, 2,277 of which are of domestic manufacture, 301 English, 190 Belgian, 60 American, and 22 French. In Berlin (Prussia), there is one of the largest locomotive shops in the world. It has turned-out 1,200 engines since it was established, a few years ago.

The Metropolitan Board of Works have advertised for tenders to supply per-chloride of iron for deodorizing the Thames and other sweet-smelling institutions in London during the present summer. No less than 5,000 gallons will be required per day, and double this amount on some occasions. We recommend this substance to the Health Commissioners of New York; they may require some of it during the approaching warm season.

NEW YORK MARKETS.

BEESWAX—American yellow, 33c. a 35c. per lb.

BREAD.—Ship, 3¼c. a 4¼c. per lb.

CANDLES.—Sperm, city, 38c. a 40c. per lb.; sperm, patent, 48c. a 50c. wax, paraffine, 50c.; adamantine, city, 17c. a 19c.; stearic, 27c. a 28c.

COAL.—Anthracite, $4.75 a $5; Liverpool orrel, per chaldron, $8.25; cannel, $10 a $10.50.

COPPER.—Refined ingots, 23c. per lb.; sheathing, 27c.; yellow metal, 20c.

CORDAGE.—Manilla, American made, 8c. a 8¾c. per lb.; Rope, Russia hemp, 12c.

COTTON.—Ordinary, 7¾c. a 8c.; good ordinary, 9c. a 9¾c.; middling, 11¼c. a 11⅝c.; good middling, 11⅞c. a 12¾c.; middling fair, 12⅛c. a 13½c.

DOMESTIC GOODS.—Shirtings, brown, 30-inch, per yard, 6c. a 7¼c.; shirtings, bleached, 26 a 32-inch, per yard, 6c. a 8c.; shirtings, bleached, 30 a 34-inch, per yard, 7c. a 8½c.; sheetings, brown, 36 a 37-inch, per yard, 5½c. a 8¾c.; sheetings, bleached, 36-inch, per yard, 7½c. a 15c.; calicoes, 6c. a 11c.; drillings, bleached, 30-inch, per yard, 8¾c. a 10c.; cloths, all wool, $1.50 a $2.50; cloths, cotton warp, 62c. a $1.37; cassimeres, 75c. a $1.50; satinets, 30c. a 60c.; flannels, 15c. a 30c.; Canton flannels, brown, 8½c. a 15c.; Kentucky jeans, 8c. a 18c.

DYESTUFFS.—Barwood, per tun, $18 a $20; Camwood, $109 a $125; Fustic, Cuba, $38 a $39; Fustic, Tampico, $35; Fustic, Savanilla, $30 a $32; Fustic, Maracaibo, $19 a $20; Logwood, Laguana, $22 a $23; Logwood, Tabasco, $21; Logwood, St. Domingo, $14.50 a $15; Logwood, Honduras, $16 a $17; Logwood, Jamaica, $13.50 a $14; Lima wood, $50 a $65; Sapan wood $45.; Cochineal, per lb., $1.08; Bichromate of potash, 20c. a 21c. per lb.; Cream of tartar, 38c. per lb.; Madder, 13c, per lb.; Lac dye, 10 c. a 50c. per lb.; Blue vitriol, 9¼c. per lb.; Catechu, 6½c. a 7¼c. per lb.; Copperas, 1¾c. per lb.

FLOUR.— State, superfine brands, $5.40 a $5.45; State, extra brands $5.50 a $5.60; Michigan fancy bands, $5.50 a $5.70; Ohio, common brands, $5.60 a $5.70; Ohio, fancy brands, $5.85 a $5.95; Ohio, fair extra, $6.15 a $6.25; Ohio, good and choice extra brands, $6.30 a $7.25; Michigan, Indiana, Wisconsin, &c., $5.60 a $6; Genesee, fancy brands, $5.70 a $5.80; Genesee, extra brands, $5.85 a $7.50; Missouri, $5.75 a $7.85; Canada, $5.70 a $7.40; Virginia, $7 a $8; Rye flour, superfine, $3.80 a $4.25; corn meal, $3.80

GUMS.—Per lb. Gamboge, 25c.; Arabic, picked, 14c. a 28c., sorts, 10c. a 10¾c.; Benzoin, 50¾c.; Copal, Cowrie, 4¾c. a 5¾c.; Damar, 9¾c. a 14c.; Myrrh, East India, 10c. a 25c.; Myrrh, Turkey, 25c. a 32c.; Senegal, 6c. a 10c.; Tragacanth, sorts, 17c. a 37½c.; Tragacanth, white flaky, 75c. a 80c.; Shellac, 50c. a 55c.

HEMP.—American undressed, $120 a $150; dressed, from $160 a $200. Jute, $100. Italian, $275. Russian clean, $190 a $200 per tun. Manilla, 6½c. per lb. Sisal, 5⅝c.

INDIA-RUBBER.—Para, fine, a 65c. per lb.; East India, 52c. a 55c.

INDIGO.—Bengal, $1 a $1.55 per lb.; Madras, 70c. a 95c.; Manilla 60 c. a $1.10; Guatemala, $1 a $1.25.

IRON.—Pig, Scotch, per tun, $24; bar, Swedes, ordinary sizes, $85 a $86; bar, English, common, $41 a $42.50; refined, $50 a $52; sheet, Russia, 1st quality, per lb., 12c. a 13c; sheet, English, single, double and treble, 3½c. a 3¾c.; anthracite, pig, $24 per tun.

IVORY—Per lb., $1.25 a $1.30.

LATHS.—Eastern, per M., $1.50 a $1.75

LEAD.—Galena, $5.90 per 100 lbs.; German and English refined, $5.65 a $5.70; bar, sheet and pipe, 6¼c. a 7c. per lb.

LEATHER.—Oak slaughter, light, 28c. a 31c. per lb.; Oak, medium 28c. a 31c.; Oak, heavy, 28c. a 30c.; Oak, Ohio, 28c. a 30c.; Hemlock, heavy, California, 19½c. a 20½c.; Hemlock, buff, 15c. a 18c.; Cordovan, 50c. a 60c.; Morocco, per dozen, $21 a $23; Patent enameled, 15c. a 25c. per foot; light Sheep, morocco finish, $7.50 a $8.50 per dozen; Calf-skins, oak, 50c. a 55c. per lb.; Hemlock, 37c. a 55c.; Belting, oak, 32c. a 34c.; Hemlock, 28c. a 31c.

LIME.—Rockland, 75c. per bbl.

LUMBER.—Timber, white pine, per M. feet, $17.75; yellow pine, $35 a $40; oak, $25 a $30; Eastern pine and spruce, $13.50 a $15; White Pine, clear, $35 a $37.50; White Pine, select, $25 a $30; White Pine, box, $16 a $18; White Pine, flooring, 1¼ inch dressed, tongued and grooved, $24.50 a $28; Yellow Pine, flooring, 1¼ inch, dressed, tongued and grooved, $29 a $35; Black Walnut, good, $45; Black Walnut, 2d quality, $30; Cherry, good, $45; White Wood, chair plank, $42; White Wood, 1 inch, $23 a $25; Spruce Flooring, 1¼ inch, dressed, tongued and grooved, each, 21c. a 22c; Spruce Boards, 14c. a 16c.; Hemlock Boards, 12½c. a 13c.; Hemlock wall strips, 10c. a 11c.; Shingles, cedar, per M. $28 a $55; Shingles, cypress, $12 a $25; Staves, White Oak, pipe, light, $65 a $68; Staves, do., pipe, heavy, $80 a $85; Staves, white oak, pipe, culls, $30 a $35; Staves, do. hhd., heavy, $70; Staves, do. bbl. light $30 a $35; Staves, do. bbl. culls, $20; Mahogany—St. Domingo, fine crotches, per foot, 35c. a 45c.; St. Domingo, ordinary do., 20c. a 25c. Honduras, fine, 12½c. a 15c.; Mexican, 13c. a 15c.

NAILS.—Cut, 3½c. a 3¾c. per lb.; American clinch, 4¾c. a 5¼c. American horse-shoe, 14c. a 18c.

OILS.—Olive, Marseilles, baskets and boxes, $3.50 a $3.55; Olive, in casks, per gallon, $1.20 a $1.30; Palm, per pound, 9½c.; Linseed, city made, 60c. a 61c. per gallon; linseed, English, 61c.; whale, fair to prime, 35c. a 37c.; whale, bleached, 57c.; sperm, crude, $1.41 a $1.44; sperm, unbleached winter, $1.45; lard oil, No. 1, winter, 90c. a 93; red oil, city distilled, 55c.; Wadsworth's refined rosin, 25c. a 35c.; boiled oil for painting, 25c. a 35c.; tanner's improved and extra, 25c. a 35c.; camphene, 47c.; fluid, 45c.

PAINTS.—Litharge, American, 7c. per lb.; lead, red, American, 7c.; lead, white, American. pure, in oil, 8c.; lead, white, American, pure, dry, 7¼c.; zinc, white, American, dry, No. 1, 5c.; zinc, white, French, dry, 7¼c.; zinc, white, French, in oil, 9½c.; ochre, ground in oil, 4c a 6c.; Spanish brown, ground in oil, 4c.; Paris white, American, 75c; a 90c. per 100 lbs.; vermillion, Chinese, $1 a $1.10; Venetian red, N. C., $1.75 a $2 per cwt.; chalk, $3.75 per tun.

PLASTER-OF-PARIS.—Blue Nova Scotia, $2.75 per tun; white, $3.50; calcined, $1.25 per bbl.

RESIN.—Turpentine, soft, per 280 lbs., $3.40 a $3.50; common, 310 lbs., $1.63; strained and No. 2, $1.65 a $1.95; No. 1, per 280 lbs., $2 a $3; white, $3 a $4; pale, $4.50 a $5.50.

SALTPETER.—Refined, 12c. a 13¼c. per lb.

SOAP.—Brown, per pound, 5c. a 8c.; Castile, 9c. a 9½c.; Olive, 7c. a 7½c.

SPELTER plates, 5c. a 5⅝c. per lb.

STEEL.—English cast, 14c. a 16c. per lb.; German, 7c. a 10c.; American spring, 5c. a 5½c.; American blister, 4½c. a 5¼c.

SUGAR.—New Orleans, 6c. a 8c. per lb.; Porto Rico, 6c. a 8c.; Havana, brown and yellow, 7c. a 8½c.; Havana, white, 8¾c. a 9c.; Brazil, white, 8c. a 8¼c.; Brazil, brown, 6c. a 7c.; Stuart's granulated, 9⅜c.

SUMAC.—Sicily, $60 a $80 per tun.

TALLOW.—American prime, 10½c. a 10¼c. per lb.

TIN.—Banca, 31½c.; Straits, 30c.; plates, $6.50 a $9.25 per box.

WOOL.—American, Saxony fleece, per lb., 54c. a 58c.; American full blood merio, 48c. a 52c.: extra, pulled, 42c. a 47c.; superfine, pulled, 36c. a 38c.; California, fine, unwashed, 20c. a 28c.; California, common, unwashed, 10c. a 18c.; Mexican, unwashed, 11c. a 14c.

ZINC.—Sheets, 7c. a 7¾c. per lb.

The foregoing rates indicate the state of the New York markets up to May 2d.

There is a slight change in the price of ordinary cotton from last month, but all the other qualities remain unaltered. No change has taken place in domestic dry goods, and none in dye-stuffs; but the latter business is quite dull at present. This is rather an unfavorable sign in reference to calico-printing, woolen cloth and carpet manufacturing. The changes in flour have been considerable, and with an advance on most brands amounting to 25c. per barrel. There has been a fall of about $1 per tun on pig iron, and a slight rise in lead.

We notice a reduction in the prices of some sorts of leather; also, in most of our domestic oils and naval stores. There are quite a number of changes in the above table from the one of last month; mostly in reduced prices. Oil from cotton seed is becoming a marketable commodity. From conversations with those who have visited the Pennsylvania oil regions, we have been informed that it extends for a distance of 200 miles in length, and is 40 miles in breadth. Some suppose that the subterranean supply is inexhaustible; while some suppose that the oil wells will soon give out. There is quite an excitement among the people in the whole valley of "Oil creek," and it is very difficult to get at facts as to the quantity obtained from a single boring. Some of the coal oil manufacturers entertain fears that these natural oil fountains will affect their business and lower their prices.

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WEEKLY SUMMARY OF INVENTIONS.

The following inventions are among the most useful improvements patented this week. For the claims to these inventions the reader is referred to the official list on another page:—

BONNET CLASP.

To explain the object and nature of this invention we shall first briefly describe the old plan of making the wire frames of bonnets. These frames are made upon a shape constructed of buckram or other stiff fabric or material, with an outwardly projecting margin, which serves as a guide or gage around and within which to lay the wire in proper form to make a frame; and the wire as it is laid around this margin is tacked or stitched to it with a needle and thread to confine it in proper form; and when the frame is so far completed as to permit it been taken off the shape, the tacking-threads requires to be cut and pulled out. The object of this invention is to dispense with the tacking or stitching and to provide a more convenient means of confining the wire to the shape and removing it therefrom when the frame is so far completed as to permit it; and with this end in view, the nature of the invention consists in a metal clasp of an elastic character and of a peculiar construction, which enables it to be readily applied to secure the wire to the margin of the shape at suitable intervals and as readily removed when the confinement of the wire is no longer necessary. The credit of this contrivance is due to H. A. Reynolds, of this city.

SEPARATOR.

This invention relates to an improvement on a machine for separating garlic from wheat and other grain, for which machine Letters Patent were granted bearing date December 21, 1858. The machine previously patented consists of rollers and a feeding device so arranged that the grain and garlic seed would both be crushed separately from each other by the rollers; the moist garlic seed adhering to the rollers and the crushed grain falling between them; the separation of the garlic seed from the grain, being due to the adhesive tendency of the crushed garlic seed. The object of the present invention is to effect the separation of the garlic seed from the wheat or other grain without crushing the latter. This result is obtained by substituting rollers with an elastic surface, sufficiently soft to yield to the wheat or grain and allow it to pass through uncrushed, but at the same time sufficiently hard to crush the garlic seed, so that it may adhere to the rollers as before, and be scraped or stripped therefrom. This device has been patented to Philip C. Fritz, of Barrytown, N. Y.

SEWING MACHINE.

This invention consists in so applying the feeding device in combination with the needle of a sewing machine, and with the device or devices operating in conjunction with the needle to enchain the loops of a single thread carried by it through the fabric to be sewed, that the feed movement is imparted to the fabric only after every second passage of the needle into the cloth and corresponding operation of the looping or enchaining device, for the purpose of producing a stitch as herein described. It also consists in certain novel means of combining the needle arm or needle-operating lever with the main shaft or other rotating shaft of the sewing machine which carries the feeding cam, for the purpose of producing two vibrations of the said lever back and forth by every revolution of the said shaft. This machine is for making the stitch patented last week by the same inventor. This improvement was designed by James S. McCurdy, of Brooklyn, N. Y.

SHARPENING VENEER-CUTTERS.

The object of this invention is to obtain, by a simple means, a device by which the proper level or basil may be given the knives of veneer-cutting, and similar or analogous machines. The invention is designed for sharpening knives for those machines in which either the bolt or the knife moves in the arc of a circle, and which consequently requires, in order to do perfect work, that the basils of the knives have a curvature corresponding to the arc in which they or the bolts move. To this end a rotary and traversing grinding wheel is employed, and the same applied to the bolt bar, or stock of the machine, so that it will have the same vibratory motion as the bolt bar when in operation for cutting the bolts, whereby the grinding wheel is presented to the knife so as to sharpen it with a proper concave basil. This device has been patented to J. H. Goodell and A. T. Goodell, of this city.

COOKING RANGE.

This invention relates to an arrangement in that class of ranges, for which a patent was obtained by the same inventor in the year 1849, and it consists in arranging on the rear end of the fire-chamber a hinged water-back on one side, and a hinged fire-brick on the other, to be operated by a certain combination of rods and levers in such a manner that either the water-back or the fire-brick can be brought in the proper position to form the back of the fire-place. It consists also in combining with the ovens, the fire-place and draft-chambers leading from the same to and around the ovens, a passage to admit cold air, which, by coming in contact with the heated walls of the ovens and draft-chambers, becomes heated so as to serve for warming the house, thereby rendering this range complete as well for cooking and baking as for heating. The inventor of this improvement is Fred. S. Merritt, of this city.

CAR BRAKE.

This invention consists in arranging the car body, the track and the brake-shoes, in such relation to each other that the inertia of the car body serves to operate the brakes. This object is effected by arranging slotted arms or rockshafts, which are actuated by a strong motion imparted to the car body by its momentum or inertia independent from the truck, in such relation to the brake-shoes, that the brakes are applied as soon as the speed of the truck is checked, and taken off on suddenly increasing the speed of the truck. By these means the engineer has perfect control over the brakes of the whole train. This improvement was designed by E. F. Jewett, of Plainville, Ohio.

LOOMS.

This invention relates to that loom known as the "narrow-ware" loom used in weaving tapes and other narrow fabrics. In these looms it is well known several webs are woven at the same time. The object of the invention is to weave articles or fabrics composed of a series of narrow webs united together at intervals by a filling running through the whole series, such as horse-nets and skeleton skirts, and to this end the nature of the invention consists in a certain construction of the raceway of such looms to provide for the introduction of a filling which will extend through the whole or any portion of the series of narrow webs. The inventor of this improvement was Aaron Williamson, (now deceased) of this city. The assignees are B. Hardy & T. France, same place.

PIANO-FORTE.

The object of this invention is to simplify the construction of piano-fortes, at the same time to give increased firmness and durability, and to allow a longer or more extended scale to be used in a case of a given size; and to this end the invention consists in so constructing, of a single casting, and applying what is termed the full iron plate, as to make it constitute the upper part of the sides, back and front of the case. James A. Gray, of Albany, N. Y., is the inventor.

REGULATOR FOR GAS-BURNERS.

This improved regulator consists of a combination of a valve, an independent weight or its equivalent and a stop, the whole applied, arranged and operating very effectively within a burner to produce a uniform issue of gas therefrom and consequently a uniform light, under all variations of pressure in the main or in the pipe which supplies the burner. The credit of this contrivance is due to G. W. Thompson, of this city.

RECEPTION OF THE JAPANESE.—The city government of New York has appropriated $30,000 for the reception of the Japanese embassy which is now on its way to this city. Extensive apartments are to be fitted up in the Metropolitan Hotel, which will be furnished, as much as possible, to accommodate the strange islanders in the mode to which they have been accustomed. It is announced that the *Niagara* is to be sent round to Panama to take these foreigners home when they are ready to return.

THE *Times* Paris correspondent says:—"The Emperor Napoleon has approved the model of a gunboat constructed on a spstem to be propelled without steam, and has ordered boats to be built on this plan. The power intended to be substituted for steam is hot air. The inventor of this power is a French engineer employed at Lyons. Great results are anticipated from the invention.

ISSUED FROM THE UNITED STATES PATENT OFFICE FOR THE WEEK ENDING APRIL 31, 1860.

[Reported Officially for the SCIENTIFIC AMERICAN.]

*** Pamphlets giving full particulars of the mode of applying for patents, size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & CO., Publishers of the SCIENTIFIC AMERICAN, New York.

28,044.—James Aiken, of Natchez, Miss., for an Improvement in Metal Ties for Cotton Bales:

I claim the formation of the bent plate, with the holes to receive the hoop, and also the form of the rivet catches, as aforesaid, with the mode of fastening the hoop to the plate.

28,045.—E. G. Allen, of Boston, Mass., for an Improvement in Steam Gages:

I claim, first, The use in gages for indicating the pressure of steam or other fluids of a volute spring, the coils of which are of uniform width throughout, and which taper in the thickness only, in combination with the rubber disk, or diaphragm, as set forth.

Second, The thin, flexible metallic disk interposed between the rubber diaphragm and the outer surface of the coils of the volute spring, for the purpose specified.

28,046.—Wm. M. Amall, of Sperryville, Va., for an Improvement in Grain Separators and Cleaners:

I claim the combination of the distributing and equalizing cylinder, I, with the cylinders, D and E, and with the brush, F, when the same are used and arranged substantially in the manner and for the purpose described.

28,047.—Frederick Ashley, of New York City, for an Improved Egg-beater:

I claim the combination of the beating or breaking wires, B, with the screw-threaded shaft, A, and nut, D, as and for the purpose set forth.

28,048.—S. F. Atherton, of Fitchburgh, Mass., for an Improved Machine for Splitting Hoops:

I claim the wedge, h, in combination with the levers, g, operating as described, for the purpose specified.

Second, I claim the vibrating knife, a, operating in the manner specified, for the purpose described.

28,049.—N. E. Badgley, of Gadsden, Ala., for an Improvement in Cotton Seed Planters:

I claim the arrangement of the bent bifurcated hooks, c c, slot, b, of hopper bottom, shafts S and S', opener, O, teeth T', and spring coverer, C, substantially as before shown and described.

28,050.—H. F. Baker, of Centreville, Ind., for an Improvement in Mode of Laying Drain Tiles:

I claim the employment of the slides, D D, constructed as described, the rear slide being provided with a shoulder, a, when the same are used in connection with the mole, B, for the purpose of drawing the tiles, E E, into the drain, substantially as specified.

28,051.—Wm. C. Banks, of Como Depot, Miss., for an Improvement in Corn Planters:

I claim the arrangement of the seeding wheel, F, with its flanges, b, spring cleaner, d, and adjusting device, c, connected together, substantially in the manner and for the purpose described.

28,052.—Wm. C. Banks, of Como Depot, Miss., for an Improvement in Corn Planters:

I claim the arrangement of the gage plate, m, for adjusting the size of the seed cell, when combined with the seed slide, a, or its equivalent, and when constructed and operating in connection with the other parts of the machine, substantially in the manner and for the purpose described.

28,053.—Wm. F. Beecher, of Chicago, Ill., for an Improved Pipe Wrench:

I claim, first, The thumb or tongue, d, having the recess, e, with the edges, f f, as set forth, and connected and arranged to the sliding block, g, and with the spring, as described.

Second, The sliding block, g, having clutches to traverse the grooves and the set screw, i, and arranged in relation to the other parts of the wrench, as shown and described.

28,054.—Dana Bickford, of Westerly, R. I., for an Improved Embroidery Sewing Stand:

I claim the arrangement of the work-holder clasp, B, with the heavy block, A, and the box, C, all substantially as and for the purpose specified.

28,055.—Horace Billings, of Beasdstown, Ill., for an Improved Cement:

I claim a waterproof coating composition, whose peculiarity consists in its being mainly composed of rosin and pulverized steatite, incorporated with each other in about the propotions and in the manner set forth.

28,056.—S. Bourne, Jr., of New York City, for an Improved Trunk Lock:

I claim the arrangement of the horizontally sliding spring bolts, A A, in combination with the vertically swinging hasp, E, and cam, F, constructed and operating substantially in the manner and for the purpose specified.

[This invention consists in the arrangement of two horizontally sliding spring bolts, in combination with a cam attached to a vertically swinging hasp, in such a manner that by turning down the hasp both bolts are forced out simultaneously, and as soon as the hasp is turned up, both bolts fly back spontaneously by the action of the springs attached to them, thus producing a cheap, simple, and effective fastening of trunks, boxes, &c.]

28,057.—S. Bourne, Jr., and J. G. Cunningham, of New York City, for an Improvement in Locks for Traveling Bags:

We claim the combination with the plate, A, casing, B, and eyes, a a', of a long nose, e', when the said noses are attached to the extremities of a longitudinal bolt, C, and so arranged to operate that the long nose first enters one of the eyes, a, and then the short nose enters the other eye, as and for the purposes shown and described.

[The object of this invention is to render the operation of a double fastening of the frames of traveling bags or valises practicable and easy. A double fastening of such frames is desirable, because, if the bag or valise is well filled, and the frame is fastened in the middle only, its ends spread, thereby exposing the contents. If, on the other hand, a double fastening of the usual construction is employed, it is difficult to bring both bolts to catch properly, it being requisite for this purpose to compress both ends of the frame simultaneously when the key is turned. By arranging the fastening in such a manner that

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it takes two distinct consecutive motions of the key to throw the two bolts into their respective eyes, the ends of the frame can be compressed one after the other with one hand, while the key is turned with the other.]

28,058.—J. E. Boyle, of Brooklyn, N. Y., for an Improved Vacuum Valve for Water-heating Apparatus:

I claim the application to close kitchen or house boilers of a cup leather valve, substantially as described for the purpose set forth.

28,059.—Noah Bowles, of Middletown, Md., for a Machine for Printing Addresses on Newspapers:

I claim, first, The construction of an endless chain with type boxes, c, said boxes having one or more spring sides, e, substantially as and for the purposes set forth.

Second, The construction of a type-box, c, with one or more spring sides, e, substantially as and for the purposes set forth.

Third, Arranging stationary catches, d and f, in combination with the spring sides, e, of the endless chain of type boxes, c, substantially as and for the purposes set forth.

Fourth, The combination of a paper-feeding and printing roller, M, with the endless chain of type-boxes, c, substantially as and for the purposes set forth.

Fifth, The combination of a type feed box, A, type wheel, B, and shield, b, substantially as and for the purposes set forth.

Sixth, Inking the types, by means of a series of ink rolers, I, revolving round a common central shaft, K, the roller being held in rigid or spring bearings, I′, substantially as and for the purposes set forth.

Seventh, Causing type-inking rollers I, revolving round a common central shaft, K, to travel in a straight line while in contact with the type, substantially as and for the purposes set forth.

Eighth, Combining a series of ink rollers, I, arranged in spring bearings, I′, with an ink roller, H, arranged at a certain distance from the common central shaft, K, of said ink rollers, substantially as and for the purposes set forth.

Ninth, The combination of a washtub O, and brush, N, with an endless chain of type boxes, c, substantially as and for the purposes set forth.

Tenth, The distributing ink roller, G, set in a vibrating frame, in combination with the main supply roller, F, receiving ink roller, H, and type-inking rollers, I, substantially as and for the purposes set forth.

[This machine comprises a type-feeding and distributing device, an inking device, a paper-feeding and printing device, and a type-cleaning device. All of these component parts work in concert and successively, in such a manner that the type are set automatically in separate boxes, and, as soon as set, are carried forward and inked perfectly; and then brought opposite a wrapped newspaper, which has been previously fed-in automatically, and addresses the same; this being done, the paper discharges in one direction, while the type passes in another direction over a revolving brush, which cleans off the ink. This done, it passes forward a short distance, and then falls into a "case" provided for its reception. This is a very ingenious and perfect organization of machinery for the purpose intended.]

28,060.—J. C. Briggs, of Woodbury, Conn., for an Improvement in Musical Reeds:

I claim making the reed with the heel and toe twist, substantially as described.

I also claim making the reed plate with one or more wind indentations, or notches, against the raised edge of the reed and with respect to the reed opening, as specified; and when they are arranged on opposite sides of the toe of the reed and one corner of the toe is elevated above the other corner, as described.

I claim making the notch, which is next to the elevated corner of less size than the other, for the purpose of equalizing or approximately equalizing the discharge of wind against opposite edges of the toe of the reed.

28,061.—S. T. Bruce, of Marshall, Mo., for an Improvement in Harvesters:

I claim the combination of the polygonally-shaped tapering roll, L, rotating immediately back of the cutting apparatus, with the obliquely-set cylindrical roll, M, and guards, G G′, and H I and K, the whole arranged and operating as specified, for the purpose set forth.

28,062.—C. S. Buchanan, of Ballston Spa., N. Y., for an Improvement in Boilers for Preparing Paper Stuff:

I claim, first, The combination with a rotary boiler, or vessel, of a cylindrical strainer, arranged within said boiler or vessel, substantially in the manner and for the purposes specified.

Second, In rotary boilers, or vessels, provided with cylindrical and concentric strainers, I claim the construction and arrangement of ribs in the form of gutters, substantially as described and for the purposes set forth.

Third, I claim providing the hollow journals of boilers or vessels constructed to operate as described, by rotation with a tubular plug, capable of being shifted on its axis, such plug having one or more openings at the inner end, so arranged as to allow of their coinciding with the channels or ways on the boiler heads, for the discharge from the boiler, of liquid or steam, or of both liquid and steam, substantially as described for the purposes specified.

28,063.—M. V. B. Buel, of Buffalo, N. Y., for an Improvement in Vapor Lamps:

I claim having the burner, E, connected to the receiver, or fount, B, by a tube, C, so that the top of the burner will extend above the highest level of the fluid in the receiver or fount, B, for the purpose specified.

[This invention relates to certain improvements in that class of lamps generally known as vapor lamps; those in which the burning fluid is volatilized and gasified in the lamp previous to burning. The object of this invention is to avoid the accidents attending the use of this class of lamps, and also to volatilize the fluid without the aid of an auxiliary flame or a heater.]

28,064.—J. A. Boyd, of Jackson county, Fla., for an Improvement in Plow Stocks:

I claim the arrangement of the bars, A and B B, collar, C, bolts E and I, hook, F, wedge, H, and depressions, G and K, as described for the purposes set forth.

28,065.—Wm. Chambers, of Muscatine, Iowa, for an Improvement in Governor Valves for Steam-engines:

I claim, first, In the construction of a governor valve of the character described, the combination of the knuckle joint, h, and pointed set screws, G L, in the manner and for the purpose described.

Second, The combination and arrangement with the governor valve D, and its rod, F, of a weighted lever, I, and spring catch, K, the whole being constructed and operating in the manner and for the purpose described.

[This invention consists in arranging a disk valve between two pointed set screws, and bringing the valve to its rod by means of a knuckle joint, in such manner that the valve may easily be adjusted in relation to its seat, so as to reduce the friction to a minimum; while there is a perfect steam-tight fit between the valve and its seat. With this valve, a weighted lever and a spring catch is used, so that the entire flow of steam from the boiler to the steam chest is instantly shut off whenever the engine attains an excessive or dangerous speed; but so long as a safe speed is maintained, the steam has perfect freedom to flow into the steam chest. We certainly regard this improvement favorably, as it undoubtedly will avoid much friction, and prove a great safeguard against damage to valuable machinery in case the main driving belt suddenly breaks.]

28,066.—J. O. Couch, of Middlefield, Conn., for an Improvement in Toy Cannons:

I claim, first, Making the barrel, the axle tree, axles, body and trails of the cannon of a single casting, substantially as described.

Second, The attachment of the hammer to the axle tree or other part of the body of the carriage, substantially as specified.

Third, The spring, G, attached to the axle tree or other portion of the body of the carriage, and operating in combination with the downward extension of the hammer, both as a main and cocking spring, substantially as set forth.

[This invention consists in making the barrel, the axle tree, axles, and the body and trails of the carriage of a toy cannon of a single casting, requiring only a pair of wheels to complete the carriage, and so making a mounted cannon of very cheap construction. It also consists in the attachment of a hammer to the axle tree, or other portion of the carriage of a toy cannon, for the purpose of firing it by a percussion priming, and thereby obviating the danger so often arising among boys by the use of powder with fire. And it further consists in a certain mode of applying a single spring, in combination with the hammer, to serve the two purposes of cocking it and giving the blow.]

28,067.—George Eaton, of Boston, Mass., for an Improvement in Rails for Street Railroads:

I claim the improved double-bearing and grooved street rail, as made in two parts, g g, bolted and arranged together, and with a gutter, water space or conductor, i, arranged between such parts and between their connections, as specified.

28,068.—Nelson Edwards, of Chittenden county, Vt., and E. G. Day, of New York City, for an Improvement in Straw-cutters:

We claim the arrangement of the blade, G, the springing guard, I, and the compressor, H, when the latter is made of tapering form, as described, for the purpose set forth.

28,069.—S. T. Fowler, of Brooklyn, N. Y., for an Improvement in the Construction of Concrete Walls:

I claim the combination, with a concrete wall, of the framing composed of the timbers, 1 and 2, arranged in the wall, substantially as described, for the purpose set forth.

28,070.—Charles Fricke, of Mobile, Ala., for an Improved Cement:

I claim the described waterproof composition or mortar cement for laying brick, stone, &c., compounded substantially as described.

28,071.—P. C. Fritz, of Barrytown, N. Y., for an Improvement in Grain-cleaners:

I claim the combination of the garlic-mashing, india-rubber surfaced rollers, B b, garlic-discharging brushes or doffers, C C, and wheat-exit spout, Z; the whole being constructed and arranged and operating substantially as and for the purposes set forth.

28,072.—A. M. George, of Nashua, N. H., for an Improvement in Mowing Machines:

I claim the combination of the compound slide, W and O, with the guides, X X, the stirrup and shipping levers, K and G, spring, J, and hook or stop, H, arranged for operation in the manner and for the purpose specified.

28,073.—Lyman Gibson, of Elmira, N. Y., for an Improvement in Water Wheels:

I claim the arrangement and combination of the case, A, having scrolls, B, wheel, D E, having radial arms, d, cylinder, C, having openings, a, and the angular-inclined buckets, f, attached at rim, e, the whole being constructed and arranged for joint operation in the manner and for the purpose described.

[The object of this invention is to obtain a center-vent water wheel that will run without being retarded with dead water as hitherto, and also one that will be simple in construction and acted upon both by the direct and re-active force of the water.]

28,074.—J. H. Goodell and A. T. Goodell, of New York City, for an Improved Method of Sharpening Cylindrical Cutting Knives:

We claim attaching the carriage, L, to the vibrating bolt or bar or stock, F, of a veneer-cutting machine, when said carriage is provided with a rotating grinding mill, M, and so arranged as to have a traversing or lateral movement on the bar or stock, F, and operate on the knife, Q, as and for the purpose set forth.

28,075.—John Grey, of Pittsburgh, Pa., for an Improved Machine for Spinning Metallic Hollow-ware:

I claim the use in machines for spinning out hollow-ware from disks of metal, of a straight cylindrical mandrel revolving on its axis, of sufficient length to sustain the disk from the circumference to the point where the operation of the tool commences, in combination with a tool having a longitudinal motion parallel to the axis or face of the cylinder, and so arranged as to compress the disk between itself and the mandrel, substantially as described.

Also, the combination of the swinging clamp frame, having its center of motion in the same vertical plane as the extremity of the mandrel, with the adjustable bar, or its equivalent, for setting the clamps which hold the disk at any required distance from the extremity of the mandrel, for the purpose of regulating at pleasure the diameter of the bottom of the kettle, or other article to be made, and at the same time permitting the side of the kettle, or other article, to lie close to the mandrel while the tool is passing over it, no matter what degree of "dish" is given to the disk.

28,076.—N. F. Griswold, of Meriden, Conn., for an Improved Ice Pitcher:

I claim a refrigerating pitcher having double walls and an ice chamber, C, communicating therewith, arranged in the manner substantially as set forth.

[This invention consists in introducing within a double wall and double bottom pitcher a chamber extending from the bottom to the top of the same, and communicating with the space between the walls at the bottom of the pitcher, into which chamber is placed granulated ice for cooling the surrounding contents. The pitcher is furnished with an escape hole for the water running from the ice, and with a perforated strainer for pouring off the liquid clear.]

28,077.—Alexander Hanvey, of Steubenville, Ohio, for an Improvement in Wooden Soles for Boots and Soes:

I claim constructing wooden soles for boots or shoes, in the manner substantially as described and represented, and when the parts are united by india-rubber, as set forth.

[This invention consists in uniting the sole by an india-rubber joint just under the ball of the foot so that flexibility and elasticity will be combined, at the same time the joint will be made waterproof; and in giving the requisite strength to the sole at the joint by interposing a small piece of wood which will fit down closely on the india-rubber over the joint of the outer sole and between and under the edges of the inner sole. The inner sole being rendered waterproof by the introduction of a strip of india-rubber under its edge, the whole, when properly secured together, is to be tacked to the upper of a boot or shoe in the usual manner of making wooden-soled boots and shoes.]

28,078.—Wm. H. Harding, of Philadelphia, Pa., for an Improved Perforating Rule for Pointers:

I claim the combination of the bar, A A, provided with a series of teeth, with the form, so that, when the impression is taken, these sharp points will perforate or deeply indent the paper, substantially as set forth.

28,079.—J. D. Heatwole and R. C. Mauck, of Harrisonburgh, Va., for an Improvement in Hominy Mills:

We claim the combination of the partition, P, with the two systems of headed beaters, c and d, on cylinder and concave, constructed, arranged and operating substantially as and for the purpose set forth.

28,080.—Arthur Hemenway, of Cleveland, Ohio, for an Improvement in Machines for Bending Fellies:

I claim the combination of the gripe, Fig. 6, screw hooks, N, and the adjusting plate, T, provided with hooks, M, when arranged in relation to the forming block, and acting conjointly in the manner and for the purpose set forth.

28,081.—J. C. Henderson, of Albany, N. Y., for an Improvement in Cooking Stoves:

I claim, first, The ash tube, t, passing from the box, S, to the hearth, f, through the oven or behind the front plate or doors, substantially as specified, whereby I am enabled to confine the ashes and prevent them entering either the oven or roaster placed on said hearth, f, as set forth.

Second, I claim the arrangement of the openings, 1 1, into the oven on each side of the ash tube, t, in the manner and for the purposes set forth.

Third, I claim admitting air to the fire from the space, 3, by the opening, 4, between the lower end of the plate, p, and the grate, r, as and for the purposes specified.

28,082.—A. Henri, of Louisville, Ky., for an Improvement in Bonnets:

I claim, as a new article of manufacture, the bonnet, constructed as described, for the purposes set forth.

[This invention consists in putting together the four parts constituting the bonnet in such a manner that the same may be made to assume a flat state, and in this shape be readily packed away in a very compact box without tumbling or injuring the bonnet, nor the trimming of the same; and when the bonnet is to be used, the parts are so put together and furnished with tie strings and hooks and eyes, or buttons and loops, that the required neatness of shape may be given to the bonnet by simply tying the strings and hooking the parts together, at the same time the peculiarity of the bonnet will be hidden from view, and, on the head, it will have all the appearance of those of the ordinary style of manufacture.]

28,083.—Samuel Hoyt, of Wilmington, Del., for an Improvement in Cementing Millstones:

I claim the use of lead, solder, or other similar molten metal, for the purpose of uniting the sections of a millstone and binding the same together at the eye and circumference, and at the same time giving increased weight to the stone, substantially in the manner described.

[By using lead, as stated in the above claim, the necessity of using cement is avoided, the molten lead insinuating itself into the cellular or honeycomb-like surfaces of the burr stone, and thereby doweling or locking the sections together in the firmest possible manner; and while this important result is attained, the metal in the spaces which heretofore were filled with light, weak cement, serves to give additional weight to the stone, the same as does the metal which has been run round the outer circumference in the eye and on the top surface of the stone, for the purpose of bracing the stone. This is a very valuable improvement, and is one of the results of twelve years' labor on the part of the inventor in developing the burr stone resources of our country.]

28,084.—W. W. Hubbell, of Philadelphia, Pa., for an Improvement in Projectiles for Breech-loading Ordnance. Anti-dated Feb. 28, 1860:

I claim, first, The combination of the recess, x, shoulders, v and w, with the band, b, and the wire coil, o, secured in the band, as described.

Second, I claim the beveled, cylindrical lead band, b, in combination with the flutes, c c c, and the wire coil, o, in the recess, x, so as to easily enter, compensate and indent the band into the rifled bore, and give it great comparative strength to retain its proper form and position under this action, and with certainty rotate the shell or shot in the breech-loading rifled gun.

Third, I claim the beveled cylindrical canvass covering extending around and in front of the lead band, and secured by the groove and wire, u, to the body of the projectile, in combination with the flutes, c c c, and the wire coil, o, so that its beveled front may easily enter and indent in the rifled bore without stripping, and the flutes allow the lead to compensate under it to the lands and grooves, and the wire strengthen and hold the lead firm that the canvas may be enabled to assume a form and firmness of bearing to co-operate with the lead band in rotating the projectile in the breech-loading rifled cannon.

Fourth, I claim the firing holes, j j, in front of the striker, in combination with the striker and the magazine, m, to facilitate the explosion in shells adapted to long arranged rifled cannon.

Fifth, I claim the circular ribs, y and z, inside of and uniform around the axis of the shell, in combination with and at each end of the circular recess, x, and band, b, so as to strengthen and support both the front and rear ends of the projectile and the base of the circular recess, resist the shock of discharge, the compression into the grooves and the shock of penetration, by restoring the strength lost in the application of the lead band.

28,085.—T. E. Hughes, of Birmingham, Pa., for an Improved Shaving Cup:

I claim the shaving cup, as a new article of manufacture, consisting of a soap cup, mirror and water receptacle, arranged and constructed as described and set forth.

28,086.—Elisha Hughes, of McCartysville, Cal., for an Improved Writing Desk:

I claim a writing box, arranged as described, with paper rollers, E and F, a blotting roller, D, at a table, C, in combination with an inkstand, G, and with an almanac roller, H, for the purpose specified.

[The object of this invention is to provide travelers with a box or valise which contains, in a comparatively small space, all the requisites for writing: viz., paper, pen and ink, and also the table on which the writing can be executed, and a blotting roller, a ruler and an almanac, the whole being arranged in a small space and convenient to be transported.]

28,087.—E. F. Jewett, of Plainville, Ohio, for an Improvement in Car Brakes:

I claim the arrangement and combination of the slotted arms, H, brake shoes, F, rockshafts, h, arms, I, and standards, J, or their equivalents, substantially as and for the purpose described.

28,808.—J. F. Keeler, of Cleveland, Ohio, for an Improved Device for Adjusting Clocks Vertically:

I claim, in the construction of clocks, the use of the plumb line, the spirit level, or the index under the pendulum, either or any of them, substantially in the manner and for the purpose set forth.

28,089.—E. R. Knorr, of Washington, D. C., for an Improved Method of Finding Courses and Bearings on Marine Charts:

I claim, first, Putting the two movable compass cards together around a hollow cylinder of metal, or any other fit material, so as to allow their adjustment over any point on the charts of conic or orthographic, or Mercator's projection, and to show at once the true and compass bearings between any two points.

Second, I claim the ruler wire or string radiating from the center, in combination with said compass cards, for the purposes set forth.

Third, I claim putting on both or either cards constituting my instrument, lines or marks, parallel or at right angles with the zero or any diameter, as means to adjust the instrument into the meridian of the chart, as well for the purpose to use both cards in connection as to use only one, detached from the other, in order to find only one of the relative bearings either true or compass.

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28,090.—George Lindsay, of Petersburgh, Va., for an Improvement in Pumps:

I claim the pump barrel, in combination with the large piston or plunger, B, the small piston, C, and the hand wheel, or its equivalent, for connecting and disconnecting the pistons, the whole being constructed and operated in the manner and for the purpose set forth.

28,091.—Benjamin Livermore, of Hartford, Vt., for an Improvement in the Construction of Cement Drains:

I claim covering or enveloping the cement aqueduct or water pipe, as it is being laid in the ditch or trench, with the flexible material, d j, in the manner and for the purposes substantially as described and set forth.

Also the attachment to the mold or former of the spindle, f, for the purpose specified.

28,092.—Henry Lockwood, of New York City, for an Improved Door Lock:

I claim the arrangement of a number of plugs or pieces, in combination with a revolving cylinder and a fixed frame, when said cylinder acts directly on the bolt while turning, in the manner and for the purpose as described.

I further claim the arrangement of the cap plate, F, so constructed as to cover the key as soon as the same shall begin to turn the cylinder, substantially as set forth.

28,093.—Wm. Mannheimer, of New York City, for an Improved Table Fork:

I claim the combination of a hollow handle, A, with a spring, B, knob, C, and additional member or prong, E, substantially as described, for the purpose aforesaid.

28,094.—Patrick McMahon, of Scottsville, N. Y., for an Improved Machine for Filing Saws:

First, I claim the combination of the spring, S, with the stop joint, n, in connection with the other parts of the file carrier, the whole operating in the manner and for the purpose substantially as set forth.

Secondly, I claim the combination of the index plate, D, and disk, d, with the shaft, C, said shaft being composed of two sections—one cylindric and the other square, the square section passing through the disk, d, and being carried round by it; the cylindric section passing through the index plate, D, and moving freely in it; the whole operating in the manner and for the purpose set forth.

28,095.—Frederick Seymour, of Cincinnati, Ohio, for an Improved Fire-escape:

I claim, first, My mode of forming ladder and shutter, having the blind, shutter or ladder folding inside of the frame.

Second, I claim the mode of fastening the ladder and shutter to the window sill, as described.

Third, I claim the combination of the ladder and shutter, substantially as described, and for the purposes set forth.

28,096.—W. S. Mayo, of New York City, for an Improvement in Water-backs for Ranges, &c.:

I claim a water-back with a compressible body or substance, of whatever form or material which, being placed inside the water-back, shall take off the pressure of freezing water and prevent the water-back from bursting when exposed to frost.

28,097.—J. S. McCurdy, of Brooklyn, N. Y., for an Improvement in Sewing Machines:

I claim, first, So applying the feeding device, in combination with the needle of a sewing machine, and with a device operating in combination with the needle, to enchain the loops of a single thread carried by it through the fabric to be sewed, that the feed movement is imparted to the fabric only after every second withdrawal of the needle from the fabric, and a stitch is produced of the structure described.

Second, Combining the needle arm or needle-operating lever with the main shaft, or with any rotating shaft, of a sewing machine, which carries the feeding cam by means of the rectangularly-grooved plate, K, sliding pins, d d, and slide, N, the whole applied and operating substantially as and for the purpose set forth.

28,098.—H. A. Mears, of Pecatonica, Ill., for an Improvement in Car Brakes:

I claim, first, The arrangement of the sliding frame, D, with the friction wheels, d d′, in combination with the friction wheel, d*, chains, g, and brakes, F F′, constructed and operating substantially in the manner and for the purpose set forth.

Second, The combination of the pawls, e, and ratchet wheels, f f′, with the friction wheels, d d′ d*, arranged in the manner and for the purpose set forth.

[This invention consists in arranging a sliding frame with two friction wheels to act on the opposite side of a corresponding friction wheel secured to the axle of one pair of wheels, in such relation to the brakes as well as to the bumpers that, in slackening the speed of the engine, the momentum of the cars causes the sliding frame to be pushed up against the friction wheel on the axle, whereby the brakes are applied. The said friction wheels are combined with ratchet wheels and pawls in such a manner that an application of the brakes in the wrong direction is prevented.]

28,099.—F. S. Merritt, of New York City, for an Improvement in Cooking Ranges:

I claim, first, The combination of the hollow faucet hinges, i, with the water-back, I, back plate, b, and supply pipes, h, so that the water will be admitted to the back, I, when the latter is turned towards the fire, and shut off when the back is swung away from the fire, as shown and described.

Second, The arrangement of the water-back, I, and fire-brick, H, to swing from opposite ends of the back plate, b, substantially as shown, so that, when desired, both fire-brick, H, and water-back, I, may be swung aside, to allow the heat of the fire to act direcly upon the air pipe, J, as set forth.

Third, The arrangement of the fire-place, A, ovens, B, gas chambers, C D E, and air chamber, J, as and for the purpose shown and described.

28,100.—E. W. Mills, of Amber, N. Y., for an Improvement in Windmills:

I claim the general arrangement and combination of the several parts, viz: hub, D, wheel, E, spring, L, and wheel, G, with its stops, N and P, and catch, Q, spring, M, rods, H, and cords, K, when constructed as specified, and used for the purpose set forth.

28,101.—O. W. Minard, of Waterbury, Conn., for an Improvement in Measuring Tapes:

I claim the employment, substantially as described, of the spring, a, the pointer, b, and the graduated plate, i, in combination with the measuring tape, for the purpose specified.

28,102.—Edward Mingay, of Boston, Mass., for an Improvement in Stove Grates:

I claim my improved arrangement of the shafts, B and D, (for effecting the rotary and tilting movements of the grate) with each other, and in respect to the grate and its surrounding ring or part, C; the shaft, D, in such arrangement, being tubular and concentric with the shaft, B, and the latter being carried through the former, and both made to project from one side of the ring, C, in manner as described and represented—the grate being operated by a slotted crank connection, or its equivalent, applied to it and the tubular shaft, D.

28,103.—G. W. Morris and Wm. Quann, of Philadelphia, Pa., for an Improvement in Restoring Burnt Iron:

We claim refining burnt iron while melting it in the cupola furnace, by mingling with it a manganesian iron ore in proper proportions and melting the whole mass together in the furnace as described.

28,104.—W. T. Nicholson, of Providence, R. I., for an Improvement in Spirit Levels:

I claim the improvement in the article of manufacture described, consisting of the use of a protecting sheath, or its equivalent, in combination with the fluid tube of a mechanic's level, substantially as described.

28,105.—J. K. Park, of Marlboro, N. Y., for an Improved Basket:

I claim constructing baskets by two lamina of wood slit towards their ends and laid across each other, and interlaced with filling, so as to form a square box shape at the bottom and a round basket shape near the top, as set forth.

And, in combination therewith, I claim the metal and wood rim, constructed as shown, with the wood rim in the inside, so as not to injure the berries, as set forth.

28,106.—Amos Seaman, of Winnebago county, Ill., for an Improvement in Corn Planters:

I claim the arrangement of the lever, A, connecting rod, B, iron straps, C, plow beams, D, axles, E, foot lever, H, post, I, crank lever, J, and axles, O, operating as described for the purposes set forth.

28,107.—Thaddeus Selleck, of Greenwich, Conn., for an Improved Method of Employing Franklinite Pig Metal for Making Grinding and Abrading Surfaces:

I claim the method herein described of employing Franklinite pig metal as a grinding or abrading surface, as specified.

28,108.—W. P. Martin, of Salem, Mass., for an Improvement in Machines for Finishing Leather:

I claim the employment of an adjustable and reversible plate, a, in combination with a suitable spring, and arranged on the hand substantially as and for the purposes specified.

I also claim the employment in the hand of a yielding tool, b, so arranged in the hand as to be capable of yielding uniformly along its whole length, or unevenly as hereinbefore drscribed for the purposes set forth.

I also claim the combination of two or more yielding tools, b c, when their edges are each ground on a different angle, as hereinbefore specified—the whole arranged to operate as and for the purposes set forth.

I also claim the combination of the spring plate, a, and yielding tools, b and c—the whole arranged and operating as specified for the purposes set forth.

I also claim arranging each glass in a separate case, i, in such manner that while the case always remains in the same relative position with the other parts of the hand, the glass or tool may be set out as and for the purpose set forth.

I also claim, in combination with the device for adjusting each end of the table separately, the bars, l and m, or their equivalents, for raising the whole table simultaneously, as and for the purposes set forth.

I also claim the combination of the slotted pendant, Q, pendulum bars, P P, bent arms, o2 o2, and the connecting rod, o, with the fly wheel, M, and fixed stud, Y; the whole arranged to operate as and for the purposes specified.

28,109.—Benjamin Singleton, of Portsmouth, Va., for an Improvement in Hammer Guards for Fire-arms:

I claim the combination of an arched guard, A, constructed and applied to a fire-arm, substantially as described, and a hammer with a laterally-projecting thumb-piece, B, working through one side of said guard, substantially as specified.

[The object of this invention is to prevent, more effectually than has hitherto been done, the accidental discharge of fire-arms, more particularly of sporting guns, by the catching of the hammers against any obstacles which may present themselves in their way, in careless carriage; and to this end the invention consists in the employment of a fixed guard constructed and applied to a fire-arm in combination with a hammer having a laterally-projecting thumb-piece working through the said guard.]

28,110.—Walter Stewart, of Natchez, Miss., for an Improvement in Wrought Iron Ties for Cotton Bales:

I claim the tie or mode of fastening iron hoops on bales (of cotton or other compressed material) by means of a link or links and serrated or notched edges of the hoop, as represented in the accompanying drawings.

28,111.—W. M. Storm, of New York City, for an Improved Safety Valve for Steam Boilers:

I claim the valve suspending the weight from and below itself and within the boiler (or a chamber opening to the same), together with an adjustable counterpoise on a lever outside; the valve also to rise independently of such lever, and to be covered by a bonnet or its equivalent—the whole being constructed, arranged and operating substantially as described.

I also claim, in combination as above, the valve and its seat, at or near the zone of their contact, spherical, so that its pendant weight may slightly oscillate it, without causing escape of steam, while thus preventing it becoming fast in its seat.

28,112.—Jacob Stuber, of Utica, N. Y., for an Improvement in Hot-air Furnaces:

I claim the independent attachment or heating apparatus designated by the letters, A a a and B, in Fig. 3, the pear-shaped pipes, C C, and the bevel or tunnel-shaped extensions of radiating surface, D D E E, in Fig. 2, as combined and arranged in the drawing accompanying my application, and described in this specification.

28,113.—G. W. Thompson, of New York City, for an Improvement in Gas-burners:

I claim the regulator composed of the valve, D, an independent weight, E, or its equivalent, and a stop, g or h; the whole applied to a burner and operating substantially as described.

28,114.—J. B. Thorp, of Plantsville, Conn., for an Improved Wagon Shaft Shackle:

I claim an improved article of manufacture (a wagon shaft shackle) constructed substantially in the manner as herein set forth and described.

28,115.—Thomas Thorp, of New York City, for an Improvement in Machines for Making Cigars:

I claim, first, Causing the belt, E, to run in a line oblique to the axis of the cigar, for the purpose of giving the latter a traversing motion towards the heading socket, K, substantially as and for the purpose set forth.

Second, I claim the employment of the conical rollers, D and D′, and conical drums, C and C′, in combination with the inclination of the axis of either, for the purpose of causing the belt, E, to retain its oblique position, substantially as described.

Third, I claim the projecting ridges, c and c′, on the drums, C and C′, in combination with the grooves, d and d′, in the rollers, D and D′, for the purposes specified.

Fourth, I claim reversing the angle made by the axis of the cigar and the path of the belt, E, substantially in the manner described, to enable one and the same machine to wind right and left hand leaves at pleasure.

28,116.—G. H. Timmerman, of St. Louis, Mo., for an Improvement in Governor Valves:

I claim, first, A double plunger balanced valve which has its plunger made tapering on the cylindrical seats of the same, made flaring at top, substantially as and for the purposes set work.

Second, Combining a hand lever, m, with a sleeve, n, through which the valve rod, k, plays, and with a clamp screw, o, by means of which the sleeve can be clamped to the valve rod, whenever it is desired, by detaching the governor by means of the screw nut, p, to work the plunger valves by hand, substantially as and for the purposes set forth.

28,117.—G. B. Turner, of Cuyahoga, Ohio, for an Improvement in Smut Machines:

I claim the holes, h, in the stationary scouring plates, Q and Q′, for the purpose of causing the grain to pass up and down through them, and thus to facilitate the operation of scouring by attrition between the grain as well as the rubbing surfaces, substantially in the manner described.

I also claim the additional scouring face, d, on the dishes, N, when the same is used in combination with the stationary and revolving scouring plates, substantially in the manner and for the purpose described.

28,118.—D. S. Wagner, of Penn Yan, N. Y., for an Improvement in Threshing Machines:

I claim the case, S, enclosing the winnowing apparatus, with the feeding wheels, g and g′, when combined with the threshing and separating chamber, V, the tube, F t t, and slats, n, as above described.

28,119.—W. W. Webster, of Foxville, Va., for an Improvement in Grain-cleaners:

I claim the employment of a system of rollers, R R′ R″, covered with cloth, felt, or other similar fibrous article, arranged in pairs, with their surfaces in contact, in combination with scrapers, S—the whole operating substantially as set forth, for receiving cockle from grain.

28,120.—W. Wells, of Boston, Mass., for an Improvement in Lasting Machines:

I claim the combination, in a lasting machine, of a holding mechanism for the purpose of holding the last and the materials thereon, with the lasting straps, g g, when these are combined with yielding springs, h h, or are elastic in themselves, and are arranged to operate on the vamp of a boot or shoe, substantially as specified.

Also, the combination, in a lasting machine, of converging toe or heel slides, or both, with yielding or elastic lasting straps.

Also, in combination with converging toe or heel slides, the block, q, carriage, m, and screw, r, or its equivalent, for the purpose set forth.

28,121.—Lewis Whitehead, of Nunda, N. Y., for an Improvement in Halters:

I claim, first, The construction of the gutter piece with two rings, or their equivalents, in such manner that the neck band may be attached to the upper one, while the chin piece or split lead passes through the ring at the lower end, and

Second, The construction of the neck band in two parts and its attachment to the upper ring of the gutter piece.

28,122.—R. A. Wilder, of Cressona, Pa., for an Improvement in Hoisting Machinery:

I claim, first, In combination with a hoisting wheel suitably furnished with cogs or other means of turning it, the ring or bearing of wood to receive the rope or cable that runs over it—constructed, arranged and operating substantially as described.

Second, I claim the shroudings, e, on hoisting wheels, to take the strain of the burden upon the rope or cable, and thus relieve the journals or axles thereof as set forth.

Third, I claim, in a hoisting apparatus, the arrangement of the hoisting, friction, guiding and holding wheels, and the rope or cable, as described and represented—the whole forming a compact, reliable and cheap hoisting apparatus, as set forth.

28,123.—C. A. Wilson, of Cincinnati, Ohio, for an Improved Steam Boiler Regulator:

I claim, first, The inverted siphon, H I, branches, J K, and check valve, L, in the described combination with a steam boiler, for the purposes set forth.

Second, The described combination of the inverted siphon, H I, with the cup, N, float, O, and dampers, F G, for the purposes described.

Third, The supplementary pipe, I′, provided with a check valve, a, and connecting the float cup, N, with the bottom of the siphon, H I, for the purposes set forth.

28,124.—Y. F. Wright, of Green Hill, Ga., for an Improvement in Cotton Presses:

I claim arranging the revolving screw nut or burr by which the screw shaft and follower of a cotton press are operated within a block, which is hinged to the upper part of the frame of said press, for the purpose of enabling the operator to swing the block and follower on said hinges, so as to clear the press box when it is is to be filled, substantially in the manner described.

28,125.—Tillotson Clarkson (assignor to B. F. Phillips & Co.), of South Adams, Mass., for an Improvement in Looms:

I claim the arrangement, relatively to one another and for united operation, of the auxiliary treadles, J J′, pawl, I, main treadle, B, ratchet wheel, G, cams, F F, and harness, D′ D″, in the manner and for the purpose described.

[This invention consists in a novel arrangement of cams and a ratchet wheel, in combination with a suitable system of treadles for fancy and figured weaving, which can be applied conveniently to any common loom.]

28,126.—S. G. Coleman (assignor to himself and Wm. Coleman), of Providence, R. I., for an Improved Mousing Hook:

I claim, as an improved article of manufacture, a hook, A, provided with a perforated stud, D, and a movable strengthening hasp, E, as shown and described.

28,127.—Edward Cotty (assignor to Adam Hauft), of Brooklyn, N. Y., for an Improved Folding Bedstead:

I claim the attaching of the head and foot pieces, C C, to the side pieces, a a, of the bottom, A, by means of the sliding or adjustable sockets, D, and screws, d, substantially as and for the purpose set forth.

[The object of this invention is to obtain a folding metallic bedstead that may be folded within a smaller compass than usual, and have its head and foot pieces so arranged that they may be adjusted in a more or less inclined position, or readily detached, or so adjusted as to give the bedstead bottom an inclined position, like a lounge; and also admit of the bedstead being shortened, if desired.]

28,128.—J. P. Ellicott, of Washington, D. C., assignor to Phelan & Collender, of New York City, for Improved Billiard Table Pocket-irons:

I claim, first, A pocket-iron of a billiard table, substantially as described, so that it may yield when struck by a ball and regain its original position after the force of the ball has been spent, as and for the purposes set forth.

Second, Hinging the pocket-irons to two arms combined with elastic washers and ball-shaped nuts, substantially as described, for the purpose of allowing the pocket-iron to yield with a parallel motion, as set forth.

Third, The pocket-iron, substantially as described, so that the outer side of the pocket-iron and of the rail of the billiard table shall be one continuous surface, and a recess for introducing the netting and elastic strap formed; and thus a neat finish secured, and the player not interfered with, as set forth.

28,129.—Humphrey Jackman, of Elizabethport, N. J., assignor to J. H. Deming and T. H. Jenkins, of New York City, for an Improvement in Journals and Boxes for Railroad Cars:

I claim the said cone on the axle, in combination with the box provided with friction rollers, the journals of which are supplied with oil by projections on the axle, which, by the rotation, carry up the oil from the lower part of the box, and apply it to the journals of the said rollers; the cone having the effect to catch the oil which is scattered by the operation of lubricating the journals of the rollers, and carry it back into the box, as specified.

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28,130.—Duncan McKensie (assignor to M. A. E. McKensie), of Brooklyn, N. Y., for an Improvement in Ovens:

I claim the combination of the hot-air flues, D, escapes, K K, and flue, I, with the lower part or floor of the oven, C', as and for the purpose shown and described.

I also claim the enlargement and downward extension of the rear end of flue, I, in combination with flue, I', as and for the purpose shown.

I also claim the arrangement, in combination with the oven, G, of the flues, I3 I I D, and the dampers, K K and L, as and for the purpose shown and described.

[This invention consists in the general arrangement and construction of a fire-place or places, with their arches and bridges or beds, and a system of escape flues which lead off from one side of the fire apartment towards the side of the oven, and conduct the heat directly from the fire and fire arches and flame bed into the oven to the top of the same, and down again, at the front and back ends of the oven, through a central flue which leads to the main escape pipe.]

28,131.—H. A. Reynolds (assignor to R. T. Wilde), of New York City, for an Improved Clamp for Bonnet Frames:

I claim the elastic clamp, constructed and operating substantially as described for purposes substantially such as that specified.

28,132.—John Stuber (assignor to John Carton), of Utica, N. Y., for an Improvement in Lamps:

I claim, first, The air chamber, I, and the air tube, K K2, as described, or substantially in that form, in combination with a shallow can, as described.

Second, The outer tube, D, in combination with the cap, E, chimney, L, and button, M, as substantially described.

28,133.—Eli Tiffany (assignor to himself and George Cooper), of Thompsonville, Conn., for an Improvement in Knitting Machines:

I claim, first, The single presser bar, D, and its arrangements, whereby it is made to operate and perform the duty of the two presser bars that are now usually employed.

Second, I claim the arrangement of the two sets of needles, crossing each other at right angles, whereby the barbs of each are acted on by the single presser bar, D, reciprocally.

28,134.—G. W. Whipple (assignor to H. Rowell & Co.), of West Acton, Mass., for an Improvement in Powder Flasks:

I claim the described cut-off for powder flasks, consisting essentially of the gate, f, disk, d, and spring, m, operating substantially as as specified.

28,135.—Benjamin Hardy (administrator of the estate of Aaron Williamson, deceased, late of New York City), assignor to himself and Thomas France, both of that city, for an Improvement in Narrow-ware Looms:

I claim constructing one portion of the raceway of a tongued plate, G, applied substantially as described, to constitute a guide, which leaves a continuous, unobstructed opening in front of the reed, clear across the loom, substantially as and for the purpose described.

28,136.—J. A. Brock, of Chicago, Ill., for an Improved Amalgamator:

I claim a revolving disk, e, subdivided into a number of receptacles, i i, in combination with an upper revolving ribbed disk, o; the two disks revolving in opposite directions, so that the ribs of the upper disk carry the pulverized ore all over the surface of the mercury, and the lower disk carries the mercury in a still plane towards the ore, substantially in the manner and for the purposes set forth.

28,137.—J. A. Gray, of Albany, N. Y., for an Improvement in Pianofortes:

I claim, first, What is termed the full iron plate of a pianoforte with an upward projecting rim, c c, along its back and sides and round the front corners, to form the upper portion of the exterior of the case, substantially as described.

Second, Casting the bottom, C, of the music rack or desk, and the brackets, b b, to which its sides are attached, with what is termed the full iron plate, substantially as specified,

28,138.—G. H. Jones and John Brown, of Rose, N. Y., for an Improvement in Water Wheels:

We claim the employment of the regulating lever, f, float, D, and gate, e, actuated by the discharge water of the wheel, to regulate the speed thereof, substantially in the manner and for the purpose shown and described.

RE-ISSUES.

Thomas Ellis, Wm. A. Ellis and A. D. Ellis (assignees of Thomas Ellis), of Philadelphia, Pa., for an Improvement in Casting Boxes for Wheel Hubs. Patented Dec. 6, 1859:

We claim supporting the sand core, E, between two sand heads, F, or their equivalents, when used in combination with a chamber, D, of uniform taper, in the manner and for the purpose substantially as set forth.

C. Aultman & Co., of Canton, Ohio, assignees of C. B. Brown, of Griggsville, Ill., for an Improvement in Grain and Grass Harvesters. Patented Dec. 7, 1852:

We claim, first, The bent main beam, so constructed as to serve as an axle for the driving wheel, a finger beam, and a support for the rear end of the tongue and the greater portion of the gearing, whereby the machine is rendered compact, strong and simple, substantially as described.

Second, Constructing the main beam of a reaper and mower with a variable bend, for the purposes substantially as described.

Third, The combination of the pallets, J j, geared together, and the arm, G, or its equivalent, with the tappet wheel, C, or its equivalent, for imparting to the cutter a vibrating motion, substantially as described.

C. Aultman & Co., of Canton, Ohio, asssignees of C. B. Brown, of Griggsville, Ill., for an Improvement in Grain and Grass Harvesters. Patented Dec. 7, 1852:

We claim, first, The combination of a skeleton track-clearer with the cutting apparatus of a mowing machine, substantially as described.

Second, The construction of skeleton track-clearers of a series of fingers, substantially as described.

Third, A yielding finger, or the equivalent thereof, in track-clearers, substantially as described.

Adolph Brown and Felix Brown of New York City, for a Machine for Cutting Loaf Sugar. Patented March 24, 1856:

We claim, first, The application and use of two or more rollers having brushes around their circumferences, and acting upon both sides of slabs of sugar, for the purpose of cleaning off the dust adhering to the same by the process of sawing, thereby re-producing the appearance of the crystals, as described.

Second, We claim, in a machine for cutting loaf sugar, the combination of two circular surfaces, with knives or cutters on each, and the knives or cutters opposite each other, substantially corresponding in form, and so combined that, in operation, the knives or cutters will act simultaneously on each side of the slab of sugar, in the manner and for the purpose substantially as described.

C. C. Bradley, Jr., of Syracuse, N. Y., for an Improvement in Grinding the Inner Surface of Cast Iron Kettles. Patented Feb. 24, 1857:

I claim forcing around the interior surface loose pieces of grinding material, by means of revolving wings or other sufficient apparatus which shall cause said loose pieces to revolve around, while they are left free to act upon the surface with which they are brought into contact, substantially in the manner and for the purpose set forth.

G. W. Hildreth, of Lockport, N. Y., for an Improved Mode of Hanging Bells. Patented June 19, 1855:

I claim the securing of the bell firmly to the yoke, and suspending the bell upon the shoulders of the bolt, c, passing up through a round hole cast or made in the top of the bell and shank, by the nut and thread upon the end of such bolt, in combination with the round tapering shank of the bell, and corresponding tapering hole in the yoke.

H. H. Stimpson, of Boston, Mass., for an Improvement in Cooking Ranges. Patented April 5, 1859:

I claim, first, The combination of the flanges or projections attached to the side plates of the boiler chambers, with the grate constructed so as to admit air to the fuel from below, and hung so as to allow of its free play, and made narrower than the fire chamber, as described, whereby the contraction and expansion of the grate is prevented from injuriously affecting the remaining portions of the range or stove.

Second, In combination with the back plate, constructed as described, I claim providing the boiler chamber with flanges or projections of such shape and width as to lap over the lateral end of said back plate, whereby the said plate is allowed to expand and contract without deteriorating the parts adjacent thereto, and without leaving open spaces for the escape at the sides of the products of combustion, substantially as set forth.

Third, The use of the sliding covers, q q, in combination with the top plate, arranged to operate substantially as described.

S. H. Titus and O. Des Granges, of St. Louis, Mo., for an Improvement in Cellular Iron Pavement. Patented Oct. 13, 1857:

We claim combining together a series of hexagonally-formed ribs and cells, so as to constitute a block of pavement of the form shown upon the drawing.

We also claim constructing each cell perfect in itself, and, by such construction, making the cells of the upper periphery of the block not only uniform, but answering as ledges to support the same upon the adjoining block, and thereby distribute the superincumbent weight weight equally along the whole side of the block, substantially in the firm manner described.

ADDITIONAL IMPROVEMENT.

F. D. Newbury, of Albany, N. Y., for an Improvement in Revolving Fire-arms. Patented June 12, 1855:

I claim the application to cylinders having their cones placed within cells, or to cylinders so fitted as to require them being capped from the rear, of a guard, constructed of a ring of metal closed at its end by a disk, having appropriate openings for the access of the hammer to each cone, and with a door giving access to the cone cells; the guard being fitted to move independently of the cylinder, or in connection with it, as required, substantially in the manner and for the purposes set forth in the above specification.

Notes & Queries.

F. B. D., of Conn.—You seem to think that a manufactory of kindling wood in this city must be a novelty. In Cincinnati there is a large and prosperous concern devoted to the manufacture of wrought iron jails. Not long ago, we procured a patent for a man, living on Long Island, for a machine for skinning eels, and it would not be surprising to hear, one of these days, that a large establishment had been erected for the manufacture of these machines. There is no limiting the progress of inventions and manufactures in this country.

C. A. H., of Mass.—There is no work published in this city on wool-carding and machinery for woolen mills.

G. P. W., of N. Y.—A large wheel runs over an obstruction more easily than a small one. The draft of a vehicle varies in the inverse ratio of the diameter of the wheels.

G. W. R., of Iowa.—By running two pairs of burr stones of different diameters with the same spur wheels and pinion, we would expect back-lash in one of the pairs, if you have ample power for driving both at once. The pinions should always be proportioned to the size of the burrs. You should increase the speed of the smaller pair.

E. M. R., of Va.—A bill of exchange for £100 at par would cost $444.44. To arrive at the cost of a foreign bill in our currency, at a certain premium—say 9, 9⅛, or 9⅜—multiply the unit at par by the rate of premium and add it to the principal; this will give the cost of the bill in dollars and cents.

J. H. T., Jr.—The only work published in this city, on ornamental weaving, is that of C. G. Gilroy, sold by J. Wiley, No. 56 Walker-street,—price, $5.

S. & S., of ——.—Please to inform us where you reside and we will write to you about your hay and cotton press.

H. C. P., of C. W.—We are much obliged for your rule on cutting patterns for the joints of stove-pipe elbows. It is no doubt a good one, but the one we published some time ago must answer for the present.

J. M., of N. Y.—In order to give directions for fixing your photograph, we should require to know the process pursued in taking it. Your shortest way will be to call on some teacher of the art for practical instruction.

W. A. L., of Ill.—Your unsatisfactory experience with the diamond, for dressing millstones, seems to have been the same as that of all who have tried it.

J. A., of Md.—The method of distilling sassafras oil, which you describe as being practiced in your section of the country, is as good as any other known to us. It is simple distillation with the common copper still. If you had pointed out the defects we might have been able to show that, while you had the proper apparatus, the operations had not been correctly conducted, owing to a want of skill in managing the business.

A. S., of R. I.—It is very difficult to give advice regarding the use of spectacles, either for persons who are short-sighted or those whose vision is failing. The best rule to pursue, in both cases, is to choose spectacles by which print like that of the SCIENTIFIC AMERICAN may be read clearly at about 18 inches from the eyes, which is the natural distance for persons who have good vision. Spectacles which greatly magnify or diminish the size of objects at the natural distance should be avoided.

W. B., of Ill.—Your views regarding the action of the paddle wheels of steamers is correct in the main, but the difficulty in the operation of the wheels of the "Great Eastern" is, not their being too small, but that they have too great a dip in the water. There is no cheap work on propellers in print in this city.

T. S. S., of Mich.—Your statement that ice-boats similar to those which produced so much excitement during the last winter, along the Hudson, have been in use on the western lakes for some time, has been received. We are pleased to give the credit of the invention to whom it is due.

G. M. McL., of N. C.—You state that you wish to obtain reliable information about employing steam or caloric for transporting large timber to sawmills. We do not know where you can get it—if you mean practical experience in the business. We suppose that you want a portable engine for hauling the timber. All you have to do for securing this object is to put a locomotive on small broad wheels.

J. M. W., of N. Y.—The conducting power of a wire depends upon its solid contents—the greater the solid contents, the less is the resistance. The inductive power of a current in the wire of a magnet is in proportion to the magnitude of the wire—the smaller the wire the more intense is the power of the magnet. A fine-wire magnet is one of intensity; a magnet having large-wire coils is one of quantity.

J. W., of N. J.—White oak fence-posts will endure much longer if Kyanized. To prepare timber with sulphate of copper, chloride of zinc, or corrosive sulphate, it requires to be steeped in a solution of these substances placed in a tank until the wood is saturated. This can be done in a very short period, in an exhausted iron tank, from which the air may be extracted by a pump, and the solution forced in under pressure; but as you have no apparatus of this kind, we advise you simply to coat the feet of your fence-posts with warm coal tar. This will render them much more durable.

N. S. C., of Mass.—The muriate of zinc, when used as a preparatory soldering solution is liable to rust tools and all iron articles with which it comes in contact. To obviate such evils, add some grains of block tin to the solution, and always wash your tools and articles with an alkaline solution, such as a little sal-soda dissolved in water. This is all the remedy we can offer at present.

G. W. J., of Mass.—It does no damage to a steam boiler to blow it out while hot, except you permit the water to fall below the fire-line. When the fire is strong, and the steam is seen issuing from the blow-cock, it is a sign that the water is too low.

MONEY RECEIVED

At the Scientific American Office on account of Patent Office business, for the week ending Saturday, May 5, 1860:—

S. & G., of Vt., $30; S. S. K., of Cal., $30; A. P. T., of Ga., $30; M. W. H., of Ind., $30; S. K., of N. Y., $30; C. C., of Iowa, $30; S. P. G., of Wis., $30; E. P. M., of N. Y., $30; W. B. T., of Mass., $25; T. B., of Ill., $25; J. B., of Pa., $30; M. H., of Conn., $30; F. G. & E. A. F., of Ill., $25; J. E., of Pa., $30; T. & R., of N. J., $200; S. J. S., of N. Y.. $45; R. N., of N. Y., $10; A. & B., of N. Y., $150; O. J. P., of Pa., $25; S. M., of Ind., $30; G. W., of N. Y., $30; J. P. B., of S. C., $30; W. H. C., of Ill., $25; S. R. B., of Pa., $30; T. S. W., of N. Y., $15; C. R. B., of Conn., $30; J. B. W., of Tenn., $15; C. E. L. H., of Conn., $30; J. C., of Vt., $25; W. G., of Wis., $23; D. P., of N. Y., $35; B. & C., of Ohio, $40; W. D. G., of N. J., $25; W. H. A., of N. Y., $56; P. V. W., of Mich., $25; K. J. G., of Ind., $25; S. & P., of Cal., $50; J. N. J., of Mass., $30; M. & B., of Mass., $30; E. P., of N. Y., $25; K. & T. C., of N. Y., $35; A. C., of N. H., $57; L. P. R., of Mich., $30; T. H., of N. Y., $25; H. A. M., of N. Y., $350; G. H. K., of Pa., $25; W. T., of N. Y., $25; J. G., of Mass., $30; G. S. G., of Pa., $25; H. & L., of N. Y., $25; C. J. H., of N. Y., $30; G. & C., of N. H., $15; T. & C. C., of Conn., $200; T. E., of Tenn., $30; L. A., of Wis., $30; G. S., of Ga., $30; D. & M., of Va., $30; G. W., of N. Y., $15; G. W. B., of Mich., $10; B. S. W., of Ohio, $25; J. J., of Pa., $30; S. T. R., of Ill., $40; J. G., of Md., $30; D. S., of N. Y., $10; S. K., of N. Y., $25; J. W., of Maine, $25; G. P. D., of Texas, $25; W. W., of Wis., $30; M. B., of N. H., $30; H. F., of Ind., $30; H. B., of Ill., $30; G. E. F., of L. I., $25; A. B. K., of N. Y., $30.

Specifications, drawings and models belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, May 5, 1860:—

W. D. G., of N. J.; O. J. P., of Pa.; A. M. C., of N. Y.; W. H. A., of N. Y. (2 cases); M. B. T., of Mass.; J. B. W., of Tenn.; S. J. H., of Ill.; F. G. & E. A. F., of Ill., G. W. R., of N. Y.; J. H. C., of N. Y.; P. V. W., of Mich.; H. & L., of N. Y.; J. W., of N. Y.; T. B., of Ill.; G. S. G., of N. Y.; W. G., of Wis.; G. H. K., of Pa.; S. S. K., of Cal.; R. J. G., of Ind.; S. J. S., of N. Y. (2 cases); S. & E., of N. Y.; C. R. A., of Conn.; E. P., of N. Y.; W. H. C., of Ill.; T. H., of N. Y.; A. H. B., of N. Y.; R. N., of N. Y.; C. J. H., of N. Y.; W. T., of N. Y.; J. T. H., of Md.; T. S. W., of N. Y.; G. F., of L. I.; G. P. D., of Texas; B. S. W., of Ohio; I. W., of Maine; E. N. F., of N. Y.; S. K., of N. Y.; K. H. & T., of Mass.; G. W., of N. Y.; J. C., of Vt.; T. M., of N. Y.

NEW BOOKS AND PERIODICALS RECEIVED.

BLACKWOOD'S MAGAZINE. Published by Leonard Scott & Co., who also publish the four great British Reviews.

This favorite magazine, for the present month, contains a leading article on the Duke of Wellington, another on Lady Hamilton, a review of Allison's History, and the story of Norman Sinclair, which is the autobiography of Professor Ayton, by himself. It is an excellent number.

THE HISTORY OF INK, including its Etymology, Chemistry and Bibliography. By Thaddeus Davids & Co., No. 127 William-street, this city.

This is altogether a unique publication, and contains a great deal of decidedly interesting matter upon a somewhat odd subject. It is, moreover, one of the most beautiful specimens of the typographic art we have ever seen.

THE BIBLICAL REASON WHY: a Family Guide to Scripture Pleadings and Handbook for Biblical Students. Illustrated with numerous engravings. Dick & Fitzgerald, publishers, No. 18 Ann-street, this city.

This work expounds, by question and answer, the most important events in the history of the Bible—the life of our Saviour and the acts of His apostles; and, so far as we can judge, it is a valuable aid to the study of the Holy Scriptures. It has received the endorsement of some of the most eminent divines of our country.

THE HAUNTED HOMESTEAD. By the well-known authoress, Mrs. Southworth. Published by T. B. Peterson & Bro., Philadelphia.

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IMPORTANT TO INVENTORS.

THE GREAT AMERICAN AND FOREIGN PATENT AGENCY.—Messrs. MUNN & CO., Proprietors of the SCIENTIFIC AMERICAN, are happy to announce the engagement of HON. JUDGE MASON, formerly Commissioner of Patents, as associate counsel with them in the prosecution of their extensive patent business. This connection renders their facilities still more ample than they have ever previously been for procuring Letters Patent, and attending to the various other departments of business pertaining to patents, such as Extensions, Appeals before the United States Court, Interferences, Opinions relative to Infringements, &c., &c. The long experience Messrs. MUNN & Co. have had in preparing Specifications and Drawings, extending over a period of fourteen years, has rendered them perfectly conversant with the mode of doing business at the United States Patent Office, and with the greater part of the inventions which have been patented. Information concerning the patentability of inventions is freely given, without charge, on sending a model or drawing and description to this office.

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A MESSIEURS LES INVENTEURS—AVIS IMportant.—Les inventeurs non familiers avec la langue Anglaise, et qui prefereraient nous communiquer leurs inventions en Francais, peuvent nous addresser dans leur langue natale. Envoyez nous un dessin et une description concise pour notre examen. Toutes communications seront recues en confidence.

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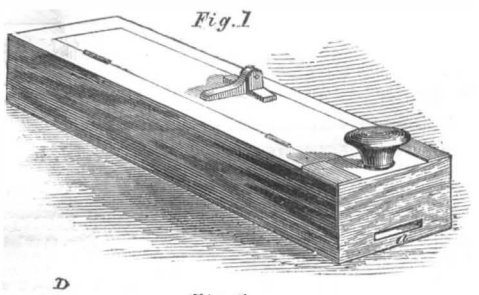
PROTZ'S KNIFE-CLEANER.

The aggregate amount of labor expended upon cleaning knives in a day, and especially in a year, would probably surprise any one who should take the trouble to investigate the subject. Any device, consequently, which materially facilitates this labor is of no inconsiderable value to the community. The neat little box which is represented in the annexed cuts, both in perspective and in section, is a simple and convenient apparatus for cleaning knives and forks, which is compact and easily kept ready at all times for use.



The box being filled with pummice stone or other suitable scouring material, the knife blade is introduced into the slit, *a*, and drawn back and forth between the leather rubbers, *b* and *c*; the rubber, *b*, being pressed down by the hand upon the knob, D. This rubber is fastened to the lower end of the block, E, which is allowed a vertical motion, and is pressed up by two springs, *i*, clear of the knife, excepting when this pressure is overcome by the hand on the knob, D.

For cleaning forks, the strap, *g*, is attached to the lower side of the lid; one end by the triangular block, *h*, and the other by the slide, *i*, which is moved back and forth by the screw rod, *j*, for the purpose of tightening the strap. This strap is brought into use by opening the lid of the box, and may be passed between the tines of the forks, as well as on each side, for the purpose of scouring them on all parts.

The patent for this invention was procured (through the Scientific American Patent Agency) on March 13, 1860; and persons desiring further information in relation to it will please address the inventor, John Protz, at Easton, Pa.

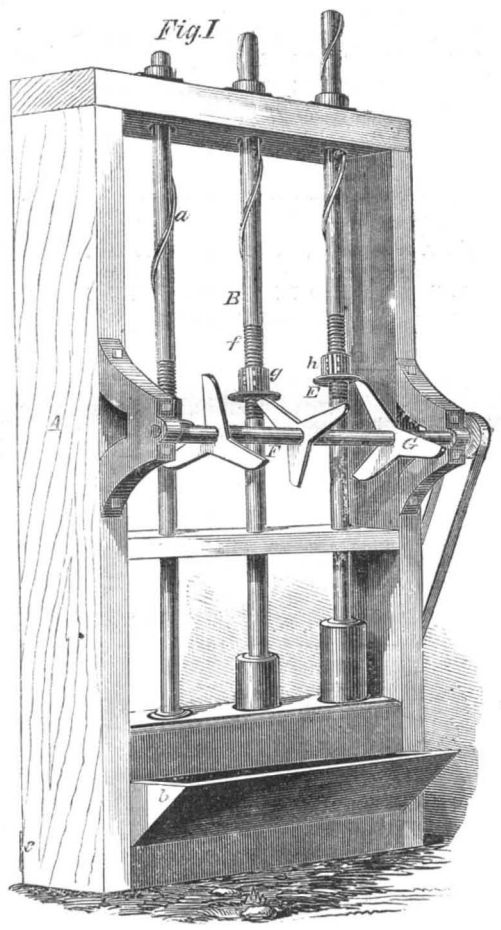
CLAY RETORTS.

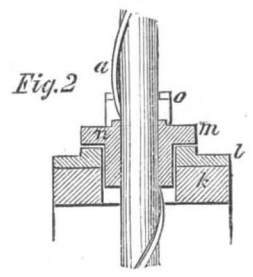
John P. Kennedy, gas engineer of Trenton, N. J., makes the following statement in regard to the comparative merits of clay and iron as a material for making retorts for distilling coal:—

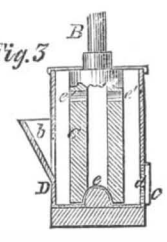
"Retorts made from fire-clay have been used successfully in Europe for many years, and they have recently been introduced into this country from Belgium, England and Scotland; and, wherever they have been used, they have given great satisfaction. The favor with which they have been received has induced several manufacturers of fire-clay materials in this country to commence the manufacture of retorts, and with good prospect of success. Although, at the present time, but comparatively few gas companies have given them a trial, I am satisfied that in a very few years they will entirely supersede iron retorts, for the following very obvious reasons, viz.: that the first cost is much below that of iron, they weigh one-third less, will endure double the time, are not injured by excessive heating, will work off the coal more rapidly, and are as easily managed as iron retorts. Many gas superintendents are under the impression that clay retorts cannot be worked without the use of an exhauster, by reason of the porous nature of the material; but this is a mistake. They require the aid of an exhauster no more than those made of iron; for after the retorts are heated, and the first charge or two made of fine coal or slack, the clay becomes filled at every pore by the carbonaceous deposit from the coal, and are then as impervious as iron retorts. Gas companies who will employ a competent and experienced workman to make the first setting of clay retorts, fire them up, and give the necessary instructions as to their treatment, will never set another iron retort."

BROWN'S QUARTZ-CRUSHER.

The gold which is found yet imbedded in the rocks of the earth occurs usually in veins of quartz, the flinty-looking stone which is one of the three ingredients of granite; and there can be little doubt that the grains of the precious metal which are found in the placer-washings have been separated from the quartz with which they were originally melted, by the wearing away of the mountains during the measureless ages that have elapsed since God said: "Let the dry land appear." These mining operations of nature were conducted on so vast a scale and through so long a period, that the gold was gathered in some places in far greater abundance than it originally existed in any equal portion of the rocks, and it is in these places accordingly that it is first sought. There are however some quartz veins which are so rich in gold that it is found profitable to pulverize the rock and extract the metal. Various modes of pulverizing have been tried, but the one generally used is the pounding process. Quartz is so hard, and when it is broken the corners and angles of the fragments are so sharp, that it makes one of the best grinding materials, and consequently, the mills which have been made for pulverizing the rock by rubbing it between two iron surfaces, have been found to wear away with unexpected rapidity. Large numbers of mills have been erected on the general plan of the one represented in the annexed engraving, and many of them are making swift fortunes for their owners.







A series of upright iron pestles, B, are raised by cams, G, upon a revolving shaft, F, and allowed to fall into a trough containing the quartz; a stream of water flowing constantly through the trough and carrying off the material as it becomes sufficiently fine. It is found that the flow of the material through the trough causes the pestles to wear more on one side than on the other, and the invention which we here illustrate is designed to obviate that difficulty. This is effected by turning the pestle partly around at each stroke, and by a peculiar form which is given to its lower end.

For turning the pestle, the spiral flanch, *a*, is secured upon the portion of the stem which works through the upper guide box, and this box is divided into two portions, one of which, *m*, is carried up a short distance with the upward motion of the pestle, till it is stopped by the guard, *o*, and when the pestle drops, the thimble, *m*, falls again into its place. The lower side of the flanch, *n*, upon this thimble is cut into ratchet teeth that engage with similar teeth upon the upper side of the box, *l*, so as to prevent the thimble from turning when it is down into its place, while it is allowed to turn freely when it is raised. The flanch, *a*, fits into grooves in the thimble, *m*, and it will be understood that this arrangement causes the pestle to turn in its descent, while the necessity of consuming power in rotating it in its ascent is avoided.

The construction of the lower end of the pestle is illustrated in Fig. 3. It is made tubular, of chilled iron, and fits over a nipple, *e*, of the same hard substance. Two orifices, *e'* *e'*, are made in the upper portion of the tube, C, to allow the air to escape as the pestle enters the water. The nipple, *e*, is secured in a manner to be removed when it is too much worn for use. The quartz and water are poured into the trough through the hopper, *b*, and pass out through the opening, *c*, which is guarded by a strainer, *d*.

In consequence of the rotation of the pestles, it is necessary that the arms upon their stems should be circular plates, in order that the cams, G, may act upon them in all positions; and in order to vary the length of the stroke, these plates are fastened to the stems by collars made in two pieces with projections on their boxes to fit grooves turned in the stems for this purpose.

The inventor, who is a practical miner and builder of quartz machinery, and an old California "forty-niner" withal, recommends that each trough or mortar should contain three pestles, each weighing about 1,000 lbs., and striking 60 blows per minute. The advantages which he claims are cheapness, durability, and but little weight in proportion to the operating capacity.

The patent for this invention was granted, through the Scientific American Patent Agency, on Nov. 29, 1859, and further information may be obtained by addressing the inventor, Thomas S. Brown, at Poughkeepsie, N. Y., Box 328.

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